

Entry Clone

Gene

L1 L2

Kan^r

Destination Vector

R1 R2

Amp^r

Incubate ~ 60' at 25 C

LR CLONASE™

Expression Clone

Gene

B1 B2

Amp^r

Transform E.coli

Amp^r Colonies Next Day

By-product

P1 P2

Kan^r

FIGURE 2

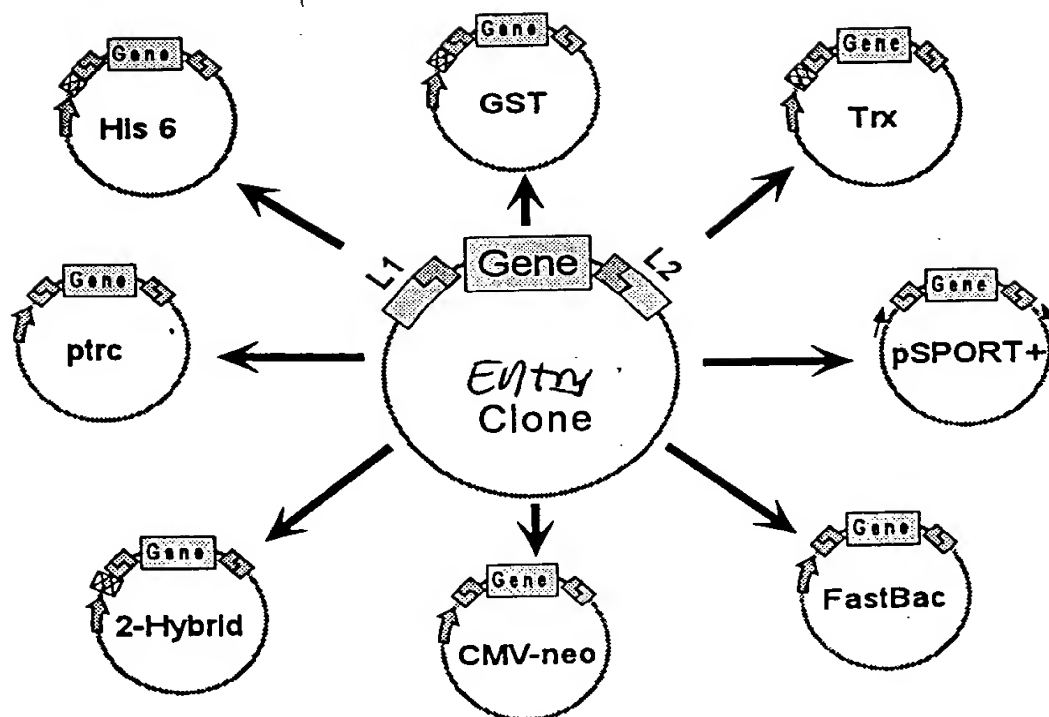


FIGURE 3

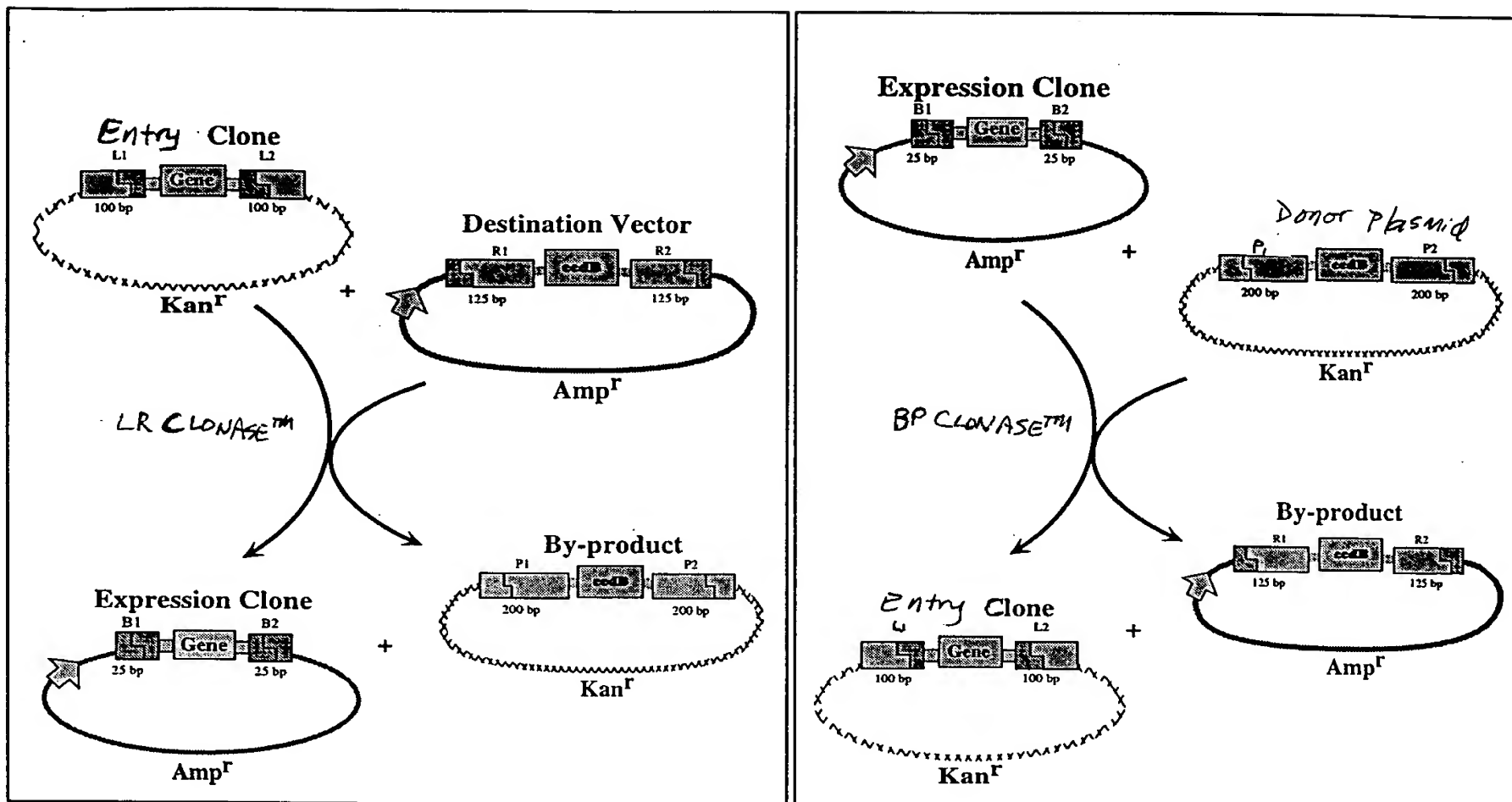
[illegible]

FIGURE 5

Diagram illustrating the second cloning strategy:

The **GENE** is flanked by **attB1** and **attB2** sites. The **attB1** site is composed of T, S, L, Y, K, K, A, G. The **attB2** site is composed of P, A, F, L, Y, K, V, V. The central coding region is flanked by **attR1** and **attR2** sites. The **attR1** site is composed of TGT, TCA, AAC, ATG, TTT, TTT, CGT, CCG, ANN. The **attR2** site is composed of NAC, CCA, GGT, TTC, TTG, TAC, AAA, GTG, GTN. The **attR1** site is labeled "From attR1" and the **attR2** site is labeled "From attR2". The **attB1** site is labeled "From Destination Vector" and the **attB2** site is labeled "From Entry Clone".

FIGURE 6

Four Ways to Make Entry Clones

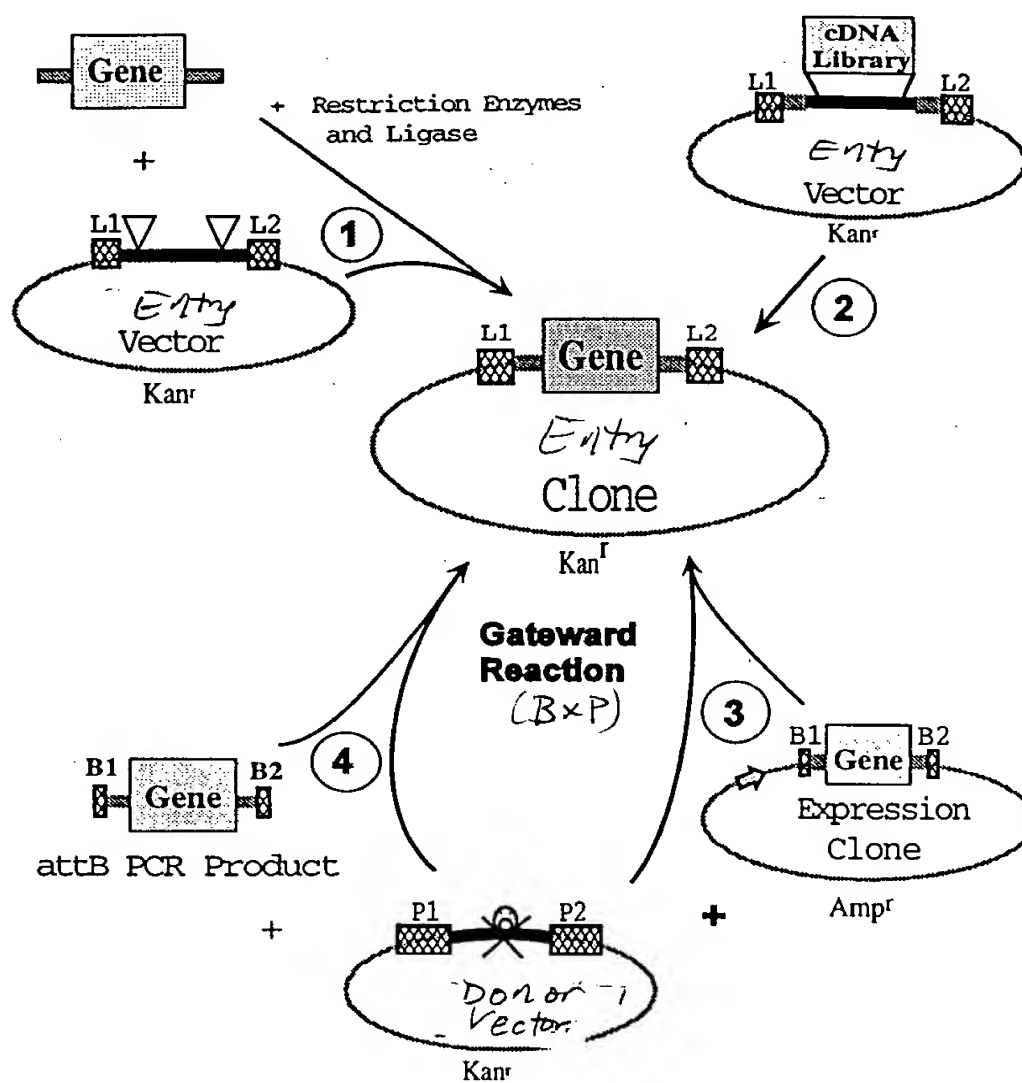


FIGURE 7

Recombination Site Nucleotide Sequences

attB1: 5'-ACAAGTTTGTACAAAAAAGCAGGCT-3'

attB2: 5'-ACCCAGCTTTCTTGTACAAAGTGGT-3'

attP1: 5'-TACAGGTCACCTAATACCATCTAAGTAGTTGATTCATAGTGACTGGATATG-TTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTA-ATATATTGATATTTATATCATTTTACGTTTCTCGTTCAGCTTTTTTTGTAC-AAAGTTGGCATTATAAAAAAGCATTGCTCATCAATTTGTTGCAACGAACA-GGTCACCTATCAGTCAAAATAAAATCATTATTTG-3'

attP2: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTCGTTGCAACAAAT-TGATAAGCAATGCTTTTCTTATAATGCCAACTTTGTACAAGAAAGCTGAAC-GAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCAT-AAAAAACAGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGA-ATCAACTACTTAGATGGTATTAGTGACCTGTA-3'

attR1: 5'-ACAAGTTTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAA-TATCAATATATTAAATTAGATTTTGCATAAAAAACAGACTACATAATAC-TGTAAAACACAACATATCCAGTCACTATG-3'

attR2: 5'-GCAGGTCGACCATAGTGACTGGATATGTTGTGTTTTACAGTATTAT-GTAGTCTGTTTTTTTATGCAAAATCTAATTTAATATATTGATATTT-ATATCATTTTACGTTTCTCGTTCAGCTTTCTTGTACAAAGTGGT-3'

attL1: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTCGTTGCAAC-AAATTGATAAGCAATGCTTTTTTATAATGCCAACTTTGTACAAAAAA-GCAGGCT-3'

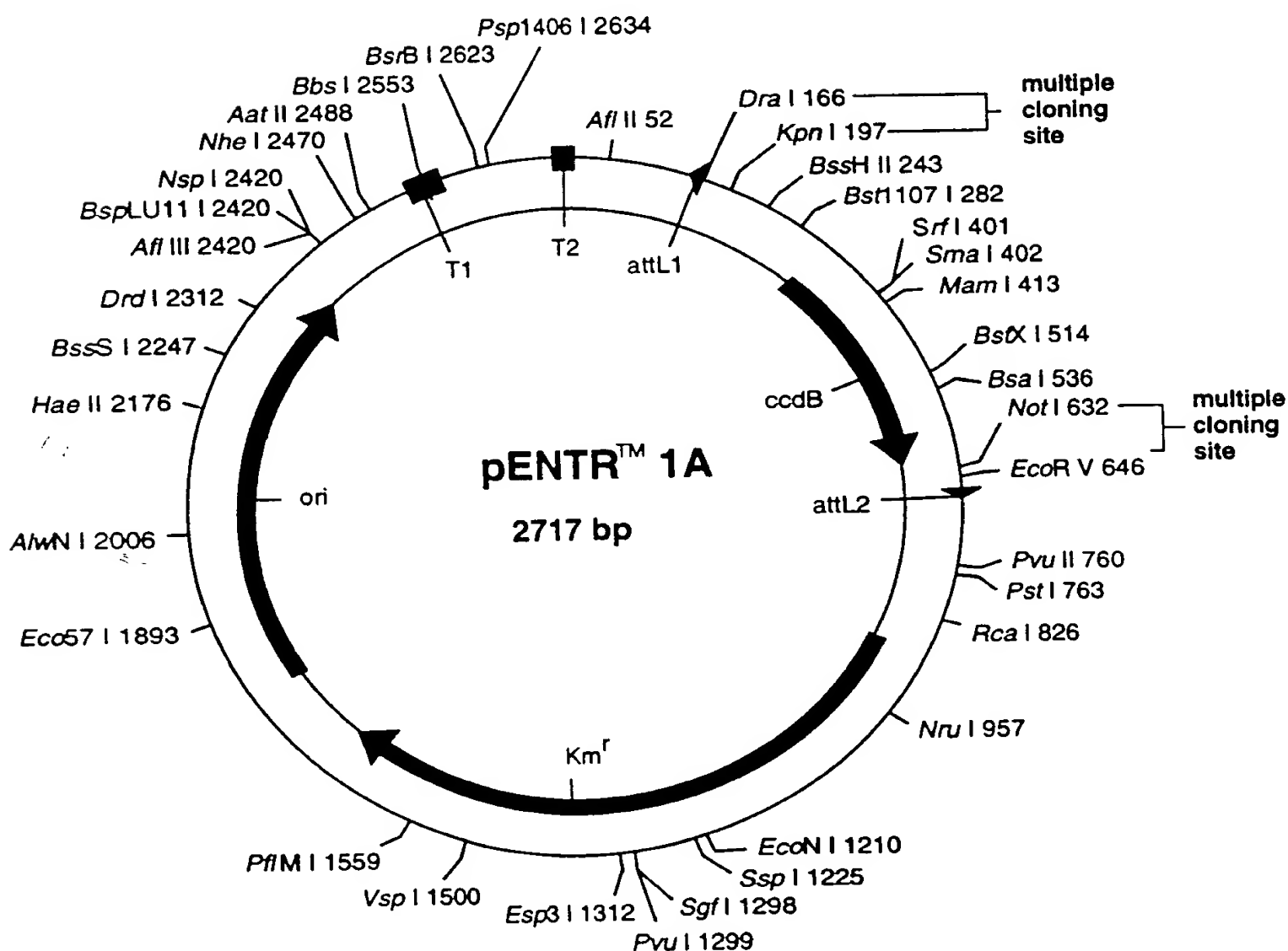
attL2: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTCGTTGCAACAA-ATTGATAAGCAATGCTTTCTTATAATGCCAACTTTGTACAAGAAAGCTGGGT-3'

Figure 9

Figure 10A: Cloning sites of the Entry Vector pENTR1A (reading frame A)

							<u>Dra I</u>			<u>Xmn I</u>			<u>Sal I</u>		<u>BamH I</u>		<u>Kpn I</u>		<u>EcoR I</u>		
ACT	TTG	TAC	AAA	AAA	GCA	GGC	TTT	AAA	GGA	ACC	AAT	TCA	GTC	GAC	TGG	ATC	CGG	TAC	CGA	ATT	C
TGA	AAC	ATG	TTT	TTT	CGT	CCG	AAA	TTT	CCT	TGG	TTA	AGT	CAG	CTG	ACC	TAG	GCC	ATG	GCT	TAA	G
thr	leu	tyr	lys	lys	ala	gly	phe	lys	gly	thr	asn	ser	val	asp	trp	ile	arg	tyr	arg	ile	

							<u>EcoR I</u>		<u>Not I</u>		<u>Xho I</u>		<u>EcoR V</u>								
---	ccdB gene	---	G	AAT	TCG	CGG	CCG	CAC	TCG	AGA	TAT	CTA	GAC	CCA	GCT	TTC	TTG	TAC	AAA		
			C	TTA	AGC	GCC	GGC	GTG	AGC	TCT	ATA	GAT	CTG	GGT	CGA	AAG	AAC	ATG	TTT		



pENTR1A 2717 bp

Base Nos.	Gene Encoded
67..166	attL1
321..626	ccdB
655..754	attL2
877..1686	KmR
1791..2364	ori

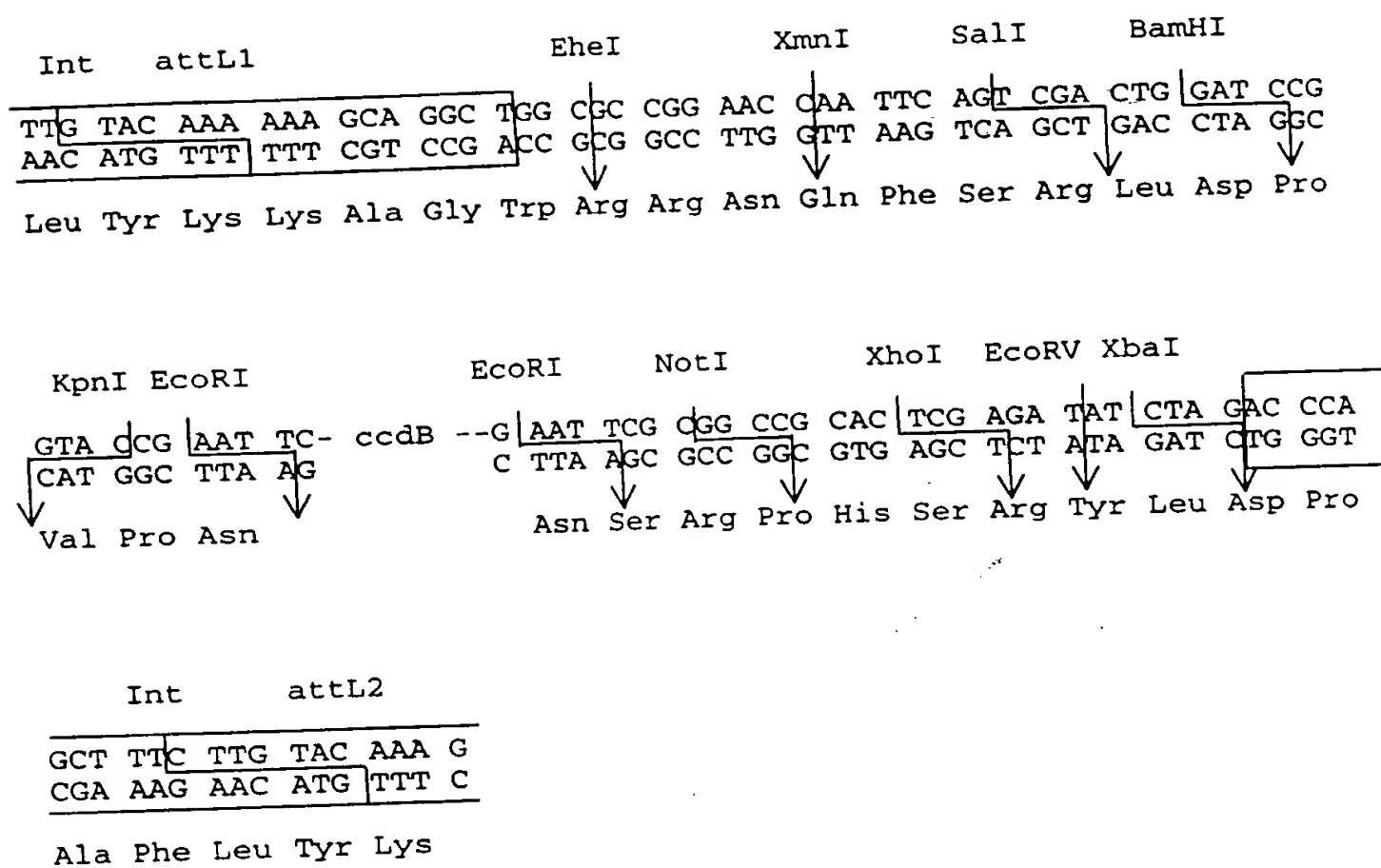
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1 CTGACGGATG GCCTTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTTTAA AGGAACCAAT
181 TCAGTCGACT GGATCCGGTA CCGAATTTCG TTAATAAAAG CCAGATAACA GTATGCGTAT
241 TTGCGCGCTG ATTTTGTGCG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA
301 AAAAGAGGTG TGCTTCTAGA ATGCAGTTTA AGGTTTACAC CTATAAAAGA GAGAGCCGTT
361 ATCGTCTGTT TGTGGATGTA CAGAGTGATA TTATTGACAC GCCCGGGCGA CGGATAGTGA
421 TCCCCCTGGC CAGTGCACGT CTGCTGTCAG ATAAAGTCTC CCGTGAACCT TACCCGGTGG
481 TGCATATCGG GGATGAAAGC TGGCGCATGA TGACCACCGA TATGGCCAGT GTGCCGGTCT
541 CCGTTATCGG GGAAGAAGTG GCTGATCTCA GCCACCGCGA AAATGACATC AAAAACGCCA
601 TTAACCTGAT GTTCTGGGGA ATATAGAATT CGCGGCCGCA CTCGAGATAT CTAGACCCAG
661 CTTTCTTGTA CAAAGTTGGC ATTATAAGAA AGCATTGCTT ATCAATTTGT TGCAACGAAC
721 AGGTCACAT CAGTCAAAAT AAAATCATTA TTTGCCATCC AGCTGCAGCT CTGGCCCGTG
781 TCTCAAAATC TCTGATGTTA CATTGCACAA GATAAAAATA TATCATCATG AACAATAAAA
841 CTGTCTGCTT ACATAAACAG TAATACAAGG GGTGTTATGA GCCATATTCA ACGGGAAACG
901 TCGAGGCCGC GATTAAATTC CAACATGGAT GCTGATTTAT ATGGGTATAA ATGGGCTCGC
961 GATAATGTCG GGCAATCAGG TGCGACAATC TATCGCTTGT ATGGGAAGCC CGATGCGCCA
1021 GAGTTGTTTC TGAAACATGG CAAAGGTAGC GTTGCCAATG ATGTTACAGA TGAGATGGTC
1081 AGACTAAACT GGCTGACGGA ATTTATGCCT CTTCCGACCA TCAAGCATTT TATCCGTACT
1141 CCTGATGATG CATGGTTACT CACCACTGCG ATCCCCGGAA AAACAGCATT CCAGGTATTA
1201 GAAGAATATC CTGATTCAGG TGAAAATATT GTTGATGCGC TGGCAGTGTC CCTGCGCCGG
1261 TTGCATTGCA TTCCTGTTTG TAATTGTCCT TTTAACAGCG ATCGCGTATT TCGTCTCGCT
1321 CAGGCGCAAT CACGAATGAA TAACGGTTTG GTTGATGCGA GTGATTTTGA TGACGAGCGT
1381 AATGGCTGGC CTGTTGAACA AGTCTGGAAA GAAATGCATA AACTTTTGCC ATTCTCACCG
1441 GATTGAGTCG TCACTCATGG TGATTTCTCA CTTGATAACC TTATTTTGA CGAGGGGAAA
1501 TTAATAGGTT GTATTGATGT TGGACGAGTC GGAATCGCAG ACCGATACCA GGATCTTGCC
1561 ATCCTATGGA ACTGCCTCGG TGAGTTTCTT CCTTCATTAC AGAAACGGCT TTTTCAAAAA
1621 TATGGTATTG ATAATCCTGA TATGAATAAA TTGCAGTTTC ATTTGATGCT CGATGAGTTT
1681 TTCTAATCAG AATTGGTTAA TTGGTTGTAA CATTATTCAG ATTGGGCCCC GTTCCACTGA
1741 GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG ATCCTTTTTT TCTGCGCGTA
1801 ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG TGGTTTGTTT GCCGGATCAA
1861 GAGCTACCAA CTCTTTTTTCC GAAGGTAAGT GGCTTCAGCA GAGCGCAGAT ACCAAATACT
1921 GTTCTTCTAG TGTAGCCGTA GTTAGGCCAC CACTTCAAGA ACTCTGTAGC ACCGCCTACA
1981 TACCTCGCTC TGCTAATCCT GTTACCAGTG GCTGCTGCCA GTGGCGATAA GTCGTGTCTT
2041 ACCGGGTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC AGCGGTCGGG CTGAACGGGG
2101 GGTTTCGTGCA CACAGCCCAG CTTGGAGCGA ACGACCTACA CCGAACTGAG ATACCTACAG
2161 CGTGAGCTAT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA AGGCGGACAG GTATCCGGTA
2221 AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC CAGGGGGAAA CGCCTGGTAT
2281 CTTTATAGTC CTGTCGGGTT TCGCCACCTC TGACTTGAGC GTCGATTTTT GTGATGCTCG
2341 TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG CCTTTTTACG GTTCCTGGCC
2401 TTTTGCTGGC CTTTGTCTCA CATGTTCTTT CCTGCGTTAT CCCCTGATTC TGTGGATAAC
2461 CGTATTACCG CTAGCATGGA TCTCGGGGAC GTCTAACTAC TAAGCGAGAG TAGGGAAC TG
2521 CCAGGCATCA AATAAAACGA AAGGCTCAGT CGGAAGACTG GGCCTTTCGT TTTATCTGTT
2581 GTTTGTCTGGT GAACGCTCTC CTGAGTAGGA CAAATCCGCC GGGAGCGGAT TTGAACGTTG
2641 TGAAGCAACG GCCCGGAGGG TGGCGGGCAG GACGCCCGCC ATAAACTGCC AGGCATCAAA
2701 CTAAGCAGAA GGCCATC

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FIGURE 10B

Figure 11A: Cloning Sites of the Entry Vector pENTR2B (reading frame B)



pENTR2B 2718 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
322..627	ccdB
656..755	attL2
878..1687	KmR
1792..2365	ori

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1 CTGACGGATG GCCTTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTGGCG CCGGAACCAA
181 TTCAGTCGAC TGGATCCGGT ACCGAATTCG CTTACTAAAA GCCAGATAAC AGTATGCGTA
241 TTTGCGCGCT GATTTTTGCG GTATAAGAAT ATATACTGAT ATGTATACCC GAAGTATGTC
301 AAAAAGAGGT GTGCTTCTAG AATGCAGTTT AAGGTTTACA CCTATAAAAG AGAGAGCCGT
361 TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA CGCCCGGGCG ACGGATGGTG
421 ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT CCCGTGAACT TTACCCGGTG
481 GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG ATATGGCCAG TGTGCCGGTC
541 TCCGTTATCG GGAAGAAGT GGCTGATCTC AGCCACCGCG AAAATGACAT CAAAAACGCC
601 ATTAACCTGA TGTTCCTGGG AATATAGAAT TCGCGGCCGC ACTCGAGATA TCTAGACCCA
661 GCTTCTTGT ACAAAGTTGG CATTATAAGA AAGCATTGCT TATCAATTTG TTGCAACGAA
721 CAGGTCAC TAAGTCAAAA TAAAATCATT ATTTGCCATC CAGCTGCAGC TCTGGCCCGT
781 GTCTCAAAAT CTCTGATGTT ACATTGCACA AGATAAAAAT ATATCATCAT GAACAATAAA
841 ACTGTCTGCT TACATAAACA GTAATACAAG GGGTGTTATG AGCCATATTC AACGGGAAAC
901 GTCGAGGCCG CGATTAAATT CCAACATGGA TGCTGATTTA TATGGGTATA AATGGGCTCG
961 CGATAATGTC GGGCAATCAG GTGCGACAAT CTATCGCTTG TATGGGAAGC CCGATGCGCC
1021 AGAGTTGTTT CTGAAACATG GCAAAGGTAG CGTTGCCAAT GATGTTACAG ATGAGATGGT
1081 CAGACTAAAC TGGCTGACGG AATTTATGCC TCTTCCGACC ATCAAGCATT TTATCCGTAC
1141 TCCTGATGAT GCATGGTTAC TCACCACTGC GATCCCCGGA AAAACAGCAT TCCAGGTATT
1201 AGAAGAATAT CCTGATTCAG GTGAAAATAT TGTTGATGCG CTGGCAGTGT TCCTGCGCCG
1261 GTTGCAATTCG ATTCCTGTTT GTAATTGTCC TTTTAACAGC GATCGCGTAT TTCGTCTCGC
1321 TCAGGCGCAA TCACGAATGA ATAACGGTTT GGTTGATGCG AGTGATTTTG ATGACGAGCG
1381 TAATGGCTGG CCTGTTGAAC AAGTCTGGAA AGAAATGCAT AACTTTTTGC CATTCTCACC
1441 GGATTTCAGT GTCATCATG GTGATTTCTC ACTTGATAAC CTTATTTTTG ACGAGGGGAA
1501 ATTAATAGGT TGTATTGATG TTGGACGAGT CGGAATCGCA GACCGATACC AGGATCTTGC
1561 CATCCTATGG AACTGCCTCG GTGAGTTTTT TCCTTCATTA CAGAAACGGC TTTTTCAAAA
1621 ATATGGTATT GATAATCCTG ATATGAATAA ATTGCAGTTT CATTTGATGC TCGATGAGTT
1681 TTTCTAATCA GAATTGGTTA ATTGGTTGTA ACATTATTCA GATTGGGCCC CGTTCCACTG
1741 AGCGTCAGAC CCCGTAGAAA AGATCAAAGG ATCTTCTTGA GATCCTTTTT TTCTGCGCGT
1801 AATCTGCTGC TTGCAAACAA AAAAACCACC GCTACCAGCG GTGGTTTGTT TGCCGGATCA
1861 AGAGCTACCA ACTCTTTTTT CGAAGGTAAC TGGCTTCAGC AGAGCGCAGA TACCAAATAC
1921 TGTTCTTCTA GTGTAGCCGT AGTTAGGCCA CCACTTCAAG AACTCTGTAG CACCGCCTAC
1981 ATACCTCGCT CTGCTAATCC TGTTACCAGT GGCTGCTGCC AGTGGCGATA AGTCGTGTCT
2041 TACCGGGTTG GACTCAAGAC GATAGTTACC GGATAAGGCG CAGCGGTCGG GCTGAACGGG
2101 GGGTTCGTGC ACACAGCCCA GCTTGGAGCG AACGACCTAC ACCGAAGTGA GATACCTACA
2161 GCGTGAGCTA TGAGAAAGCG CCACGCTTCC CGAAGGGAGA AAGGCGGACA GGTATCCGGT
2221 AAGCGGCAGG GTCGGAACAG GAGAGCGCAC GAGGGAGCTT CCAGGGGGAA ACGCCTGGTA
2281 TCTTTATAGT CCTGTCGGGT TTCGCCACCT CTGACTTGAG CGTCGATTTT TGTGATGCTC
2341 GTCAGGGGGG CGGAGCCTAT GGAAAAACGC CAGCAACGCG GCCTTTTTTAC GGTTCTTGGC
2401 CTTTTGCTGG CCTTTTGCTC ACATGTTCTT TCCTGCGTTA TCCCCTGATT CTGTGGATAA
2461 CCGTATTACC GCTAGCATGG ATCTCGGGGA CGTCTAATA CTAAGCGAGA GTAGGGAAGT
2521 GCCAGGCATC AAATAAAACG AAAGGCTCAG TCGGAAGACT GGGCCTTTTCG TTTTATCTGT
2581 TGTTTGTCGG TGAACGCTCT CCTGAGTAGG ACAAATCCGC CGGGAGCGGA TTTGAACGTT
2641 GTGAAGCAAC GGCCCGGAGG GTGGCGGGCA GGACGCCCGC CATAAACTGC CAGGCATCAA
2701 ACTAAGCAGA AGGCCATC

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FIGURE 11B

Figure 12A: Cloning Sites of the Entry Vector pENTR3C (reading frame C)

Int	attL1		DraI		XmnI		SalI		BamHI								
TTG	TAC	AAA	AAA	GCA	GGC	TCT	TTA	AAG	GAA	CCA	ATT	CAG	TCG	ACT	GGA	TCC	GGT
AAC	ATG	TTT	TTT	CGT	CCG	AGA	AAT	TTC	CTT	GGT	TAA	GTC	AGC	TGA	CCT	AGG	CCA
Leu	Tyr	Lys	Lys	Ala	Gly	Ser	Leu	Lys	Glu	Pro	Ile	Gln	Ser	Thr	Gly	Ser	Gly

KpnI	EcoRI	PvuI		EcoRI	NotI		XhoI		EcoRV	XbaI						
ACC	GAA	TTC	GAT	CGC	--	ccdB	--G	AAT	TCG	CGG	CCG	CAC	TCG	AGA	TAT	CTA
TGG	CTT	AAG	CTA	GCG			C	TTA	AGC	GCC	GGC	GTG	AGC	TCT	ATA	GAT
Thr	Glu	Phe						Asn	Ser	Arg	Pro	His	Ser	Arg	Tyr	Leu

attL2	Int						
GAC	CCA	GCT	TTC	TTG	TAC	AAA	G
CTG	GGT	CGA	AAG	AAC	ATG	TTT	C
Asp	Pro	Ala	Phe	Leu	Tyr	Lys	

pENTR3C 2723 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..166	attL1
327..632	ccdB
661..760	attL2
883..1692	KmR
1797..2370	ori

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1 CTGACGGATG GCCTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTCTTT AAAGGAACCA
181 ATTCAGTCGA CTGGATCCGG TACCGAATTC GATCGCTTAC TAAAAGCCAG ATAACAGTAT
241 GCGTATTTGC GCGCTGATTT TTGCGGTATA AGAATATATA CTGATATGTA TACCCGAAGT
301 ATGTCAAAAA GAGGTGTGCT TCTAGAATGC AGTTTAAGGT TTACACCTAT AAAAGAGAGA
361 GCCGTTATCG TCTGTTTGTG GATGTACAGA GTGATATTAT TGACACGCCG GGGCGACGGA
421 TGGTGATCCC CCTGGCCAGT GCACGTCTGC TGTCAGATAA AGTCTCCCGT GAACTTTACC
481 CGGTGGTGCA TATCGGGGAT GAAAGCTGGC GCATGATGAC CACCGATATG GCCAGTGTGC
541 CGGTCTCCGT TATCGGGGAA GAAGTGGCTG ATCTCAGCCA CCGCGAAAAT GACATCAAAA
601 ACGCCATTAA CCTGATGTTC TGGGGAATAT AGAATTCGCG GCCGCACTCG AGATATCTAG
661 ACCCAGCTTT CTTGTACAAA GTTGGCATT TAAGAAAGCA TTGCTTATCA ATTTGTTGCA
721 ACGAACAGGT CACTATCAGT CAAAATAAAA TCATTATTTG CCATCCAGCT GCAGCTCTGG
781 CCCGTGTCTC AAAATCTCTG ATGTTACATT GCACAAGATA AAAATATATC ATCATGAACA
841 ATAAACTGT CTGCTTACAT AAACAGTAAT ACAAGGGGTG TTATGAGCCA TATTCAACGG
901 GAAACGTCGA GGCCGCGATT AAATTCCAAC ATGGATGCTG ATTTATATGG GTATAAATGG
961 GCTCGCGATA ATGTCGGGCA ATCAGGTGCG ACAATCTATC GCTTGTATGG GAAGCCCGAT
1021 GCGCCAGAGT TGTTCCTGAA ACATGGCAA GGTAGCGTTG CCAATGATGT TACAGATGAG
1081 ATGGTCAGAC TAAACTGGCT GACGGAATTT ATGCCTCTTC CGACCATCAA GCATTTTATC
1141 CGTACTCCTG ATGATGCATG GTTACTCACC ACTGCGATCC CCGGAAAAAC AGCATTCCAG
1201 GTATTAGAAG AATATCCTGA TTCAGGTGAA AATATTGTTG ATGCGCTGGC AGTGTTCTCTG
1261 CGCCGGTTGC ATTCGATTCC TGTTTGTAAT TGTCTTTTAA ACAGCGATCG CGTATTTCTG
1321 CTCGCTCAGG CGCAATCACG AATGAATAAC GGTTCGGTTG ATGCGAGTGA TTTTGATGAC
1381 GAGCGTAATG GCTGGCCTGT TGAACAAGTC TGGAAAGAAA TGCATAAACT TTTGCCATTC
1441 TCACCGGATT CAGTCGTCAC TCATGGTGAT TTCTCACTTG ATAACCTTAT TTTTGACGAG
1501 GGGAAATTAA TAGGTTGTAT TGATGTTGGA CGAGTCGGAA TCGCAGACCG ATACCAGGAT
1561 CTTGCCATCC TATGGAAGTG CCTCGGTGAG TTTTCTCCTT CATTACAGAA ACGGCTTTTT
1621 CAAAAATATG GTATTGATAA TCCTGATATG AATAAATTGC AGTTTCATTT GATGCTCGAT
1681 GAGTTTTTCT AATCAGAATT GGTTAATTGG TTGTAACATT ATTCAGATTG GGCCCCGTTC
1741 CACTGAGCGT CAGACCCCGT AGAAAAGATC AAAGGATCTT CTTGAGATCC TTTTTTCTG
1801 CGCGTAATCT GCTGCTTGCA AACAAAAAAA CCACCGCTAC CAGCGGTGGT TTGTTTGCCG
1861 GATCAAGAGC TACCAACTCT TTTTCCGAAG GTAACGGCT TCAGCAGAGC GCAGATACCA
1921 AATACTGTTC TTCTAGTGTA GCCGTAGTTA GGCCACCACT TCAAGAACTC TGTAGCACCG
1981 CCTACATACC TCGCTCTGCT AATCCTGTTA CCAGTGGCTG CTGCCAGTGG CGATAAGTCG
2041 TGTCTTACCG GGTTGGACTC AAGACGATAG TTACCGGATA AGGCGCAGCG GTCGGGCTGA
2101 ACGGGGGGTT CGTGACACAA GCCCAGCTTG GAGCGAACGA CCTACACCGA ACTGAGATAC
2161 CTACAGCGTG AGCTATGAGA AAGCGCCACG CTTCCCGAAG GGAGAAAGGC GGACAGGTAT
2221 CCGGTAAGCG GCAGGGTCGG AACAGGAGAG CGCACGAGGG AGCTTCCAGG GGGAAACGCC
2281 TGGTATCTTT ATAGTCCTGT CGGGTTTCGC CACCTCTGAC TTGAGCGTCG ATTTTGTGA
2341 TGCTCGTCAG GGGGGCGGAG CCTATGGAAA AACGCCAGCA ACGCGGCCTT TTTACGGTTC
2401 CTGGCCTTTT GCTGGCCTTT TGCTCACATG TTCTTTCCTG CGTTATCCCC TGATTCTGTG
2461 GATAACCGTA TTACCGCTAG CATGGATCTC GGGGACGTCT AACTACTAAG CGAGAGTAGG
2521 GAACTGCCAG GCATCAAATA AAACGAAAGG CTCAGTCGGA AGACTGGGCC TTTCGTTTTA
2581 TCTGTTGTTT GTCGGTGAAC GCTCTCCTGA GTAGGACAAA TCCGCCGGGA GCGGATTTGA
2641 ACGTTGTGAA GCAACGGCCC GGAGGGTGGC GGGCAGGACG CCCGCCATAA ACTGCCAGGC
2701 ATCAAATAA GCAGAAGGCC ATC

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FIGURE 12B

Figure 13A: Cloning Sites of the Entry Vector pENTR4

Int attL1 NcoI Kozak XmnI SalI BamHI

TTG	TAC	AAA	AAA	GCA	GGC	TCC	ACC	ATG	GGA	ACC	AAT	TCA	GTC	GAC	TGG	ATC	CGG
AAC	ATG	TTT	TTT	CGT	CCG	AGG	TGG	TAC	CCT	TGG	TTA	AGT	CAG	CTG	ACC	TAG	GCC
								↓		↓				↓			↓
Leu	Tyr	Lys	Lys	Ala	Gly	Ser	Thr	Met	Gly	Thr	Asn	Ser	Val	Asp	Trp	Ile	Arg

KpnI EcoRI EcoRI NotI XhoI EcoRV XbaI

TAC	CGA	ATT	C--	ccdB	--G	AAT	TCG	CGG	CCG	CAC	TCG	AGA	TAT	CTA	GAC	CCA	GCT
ATG	GCT	TAA	G		C	TTA	AGC	GCC	GGC	GTG	AGC	TCT	ATA	GAT	CTG	GGT	CGA
			↓				↓		↓			↓	↓		↓		
Tyr	Arg	Ile				Asn	Ser	Arg	Pro	His	Ser	Arg	Tyr	Leu	Asp	Pro	Ala

Int attL2

TTC	TTG	TAC	AAA	G
AAG	AAC	ATG	TTT	C

Phe Leu Tyr Lys

pENTR4 2720 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
324..629	ccdB
658..757	attL2
880..1689	KmR
1794..2367	ori

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1 CTGACGGATG GCCTTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTCCAC CATGGGAACC
181 AATTCAGTCG ACTGGATCCG GTACCGAATT CGCTTACTAA AAGCCAGATA ACAGTATGCG
241 TATTTGCGCG CTGATTTTTG CGGTATAAGA ATATATACTG ATATGTATAC CCGAAGTATG
301 TCAAAAAGAG GTGTGCTTCT AGAATGCAGT TTAAGGTTTA CACCTATAAA AGAGAGAGCC
361 GTTATCGTCT GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCCGG CGACGGATGG
421 TGATCCCCCT GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA CTTTACCCGG
481 TGGTGCATAT CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC AGTGTGCCGG
541 TCTCCGTTAT CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC ATCAAAAACG
601 CCATTAACCT GATGTTCTGG GGAATATAGA ATTCGCGGCC GCACTCGAGA TATCTAGACC
661 CAGCTTTCTT GTACAAAGTT GGCATTATAA GAAAGCATTG CTTATCAATT TGTTGCAACG
721 AACAGGTCAC TATCAGTCAA AATAAAATCA TTATTTGCCA TCCAGCTGCA GCTCTGGCCC
781 GTGTCTCAAA ATCTCTGATG TTACATTGCA CAAGATAAAA ATATATCATC ATGAACAATA
841 AAAGTGTCTG CTTACATAAA CAGTAATACA AGGGGTGTTA TGAGCCATAT TCAACGGGAA
901 ACGTCGAGGC CGCGATTAAA TTCCAACATG GATGCTGATT TATATGGGTA TAAATGGGCT
961 CGCGATAATG TCGGGCAATC AGGTGCGACA ATCTATCGCT TGTATGGGAA GCCCGATGCG
1021 CCAGAGTTGT TTCTGAAACA TGGCAAAGGT AGCGTTGCCA ATGATGTTAC AGATGAGATG
1081 GTCAGACTAA ACTGGCTGAC GGAATTTATG CCTCTTCCGA CCATCAAGCA TTTTATCCGT
1141 ACTCCTGGTG ATGCATGGTT ACTCACCACG GCGATCCCCG GAAAAACAGC ATTCCAGGTA
1201 TTAGAAGAAT ATCCTGATTC AGGTGAAAAT ATTGTTGATG CGCTGGCAGT GTTCCTGCGC
1261 CGGTTGCATT CGATTCCTGT TTGTAATTGT CCTTTTAACA GCGATCGCGT ATTTCTGTCTC
1321 GCTCAGGCGC AATCACGAAT GAATAACGGT TTGGTTGATG CGAGTGATTT TGATGACGAG
1381 CGTAATGGCT GGCCCTGTTGA ACAAGTCTGG AAAGAAATGC ATAACTTTT GCCATTCTCA
1441 CCGGATTGAG TCGTCACTCA TGGTGATTC TCACTTGATA ACCTTATTTT TGACGAGGGG
1501 AAATTAATAG GTTGTATTGA TGTTGGACGA GTCGGAATCG CAGACCGATA CCAGGATCTT
1561 GCCATCCTAT GGAAGTGCCT CGGTGAGTTT TCTCCTTCAT TACAGAAACG GCTTTTTCAA
1621 AAATATGGTA TTGATAATCC TGATATGAAT AAATTGCAGT TTCATTTGAT GCTCGATGAG
1681 TTTTCTAAT CAGAATTGGT TAATTGGTTG TAACATTATT CAGATTGGGC CCCGTTCCAC
1741 TGAGCGTCAG ACCCCGTAGA AAAGATCAAA GGATCTTCTT GAGATCCTTT TTTTCTGCGC
1801 GTAATCTGCT GCTTGCAAAC AAAAAACCA CCGTACCAG CCGTGGTTTG TTTGCCGGAT
1861 CAAGAGCTAC CAACTCTTTT TCCGAAGGTA ACTGGCTTCA GCAGAGCGCA GATACCAAAT
1921 ACTGTTCTTC TAGTGTAGCC GTAGTTAGGC CACCACTTCA AGAACTCTGT AGCACC GCCT
1981 ACATACCTCG CTCTGCTAAT CCTGTTACCA GTGGCTGCTG CCAGTGGCGA TAAGTCGTGT
2041 CTTACCGGGT TGGACTCAAG ACGATAGTTA CCGGATAAGG CGCAGCGGTC GGGCTGAACG
2101 GGGGGTTCGT GCACACAGCC CAGCTTGGAG CGAACGACCT ACACCGAAGT GAGATACCTA
2161 CAGCGTGAGC TATGAGAAAG CGCCACGCTT CCCGAAGGGA GAAAGGCGGA CAGGTATCCG
2221 GTAAGCGGCA GGGTCGGAAC AGGAGAGCGC ACGAGGGAGC TTCCAGGGGG AAACGCCTGG
2281 TATCTTTATA GTCCTGTCGG GTTTCGCCAC CTCTGACTTG AGCGTCGATT TTTGTGATGC
2341 TCGTCAGGGG GGCGGAGCCT ATGGAAAAAC GCCAGCAACG CGGCCTTTTT ACGGTTCTCTG
2401 GCCTTTTGCT GGCCTTTTGC TCACATGTTT TTTCTGCGT TATCCCCTGA TTCTGTGGAT
2461 AACC GTATTA CCGCTAGCAT GGATCTCGGG GACGTCTAAC TACTAAGCGA GAGTAGGGAA
2521 CTGCCAGGCA TCAAATAAAA CGAAAGGCTC AGTCGGAAGA CTGGGCCTTT CGTTTTATCT
2581 GTTGTGTTGTC GGTGAACGCT CTCCTGAGTA GGACAAATCC GCCGGGAGCG GATTTGAACG
2641 TTGTGAAGCA ACGGCCCGGA GGGTGGCGGG CAGGACGCCC GCCATAAACT GCCAGGCATC
2701 AAATAAGCA GAAGGCCATC

```

FIGURE 13B

pENTR5 2720 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
324..629	ccdB
658..757	attL2
880..1689	KmR
1794..2367	ori

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61 GGGCCCCAAA TAATGATTTT ATTTTGA CTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTTTCA TATGGGAACC
181 AATTCAGTCG ACTGGATCCG GTACCGAATT CGCTTACTAA AAGCCAGATA ACAGTATGCG
241 TATTTGCGCG CTGATTTTTG CGGTATAAGA ATATATACTG ATATGTATAC CCGAAGTATG
301 TCAAAAAGAG GTGTGCTTCT AGAATGCAGT TTAAGGTTTA CACCTATAAA AGAGAGAGCC
361 GTTATCGTCT GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCGGG CGACGGATGG
421 TGATCCCCCT GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA CTTTACCCGG
481 TGGTGCATAT CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC AGTGTGCCGG
541 TCTCCGTTAT CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC ATCAAAAACG
601 CCATTAACCT GATGTTCTGG GGAATATAGA ATTCGCGGCC GCACTCGAGA TATCTAGACC
661 CAGCTTTCTT GTACAAAGTT GGCATTATAA GAAAGCATTG CTTATCAATT TGTTGCAACG
721 AACAGGTCAC TATCAGTCAA AATAAAATCA TTATTTGCCA TCCAGCTGCA GCTCTGGCCC
781 GTGTCTCAAA ATCTCTGATG TTACATTGCA CAAGATAAAA ATATATCATC ATGAACAATA
841 AAAGTGTCTG CTTACATAAA CAGTAATACA AGGGGTGTTA TGAGCCATAT TCAACGGGAA
901 ACGTCGAGGC CGCGATTAAA TTCCAACATG GATGCTGATT TATATGGGTA TAAATGGGCT
961 CGCGATAATG TCGGGCAATC AGGTGCGACA ATCTATCGCT TGTATGGGAA GCCCGATGCG
1021 CCAGAGTTGT TTCTGAAACA TGGCAAAGGT AGCGTTGCCA ATGATGTTAC AGATGAGATG
1081 GTCAGACTAA ACTGGCTGAC GGAATTTATG CCTCTTCCGA CCATCAAGCA TTTTATCCGT
1141 ACTCCTGATG ATGCATGGTT ACTCACCCT GCGATCCCCG GAAAAACAGC ATTCCAGGTA
1201 TTAGAAGAAT ATCCTGATTC AGGTGAAAAT ATTGTTGATG CGCTGGCAGT GTTCCTGCGC
1261 CGGTTGCATT CGATTCCTGT TTGTAATTGT CCTTTTAACA GCGATCGCGT ATTTCTGCTC
1321 GCTCAGGCGC AATCACGAAT GAATAACGGT TTGGTTGATG CGAGTGATTT TGATGACGAG
1381 CGTAATGGCT GGCCTGTTGA ACAAGTCTGG AAAGAAATGC ATAACTTTT GCCATTCTCA
1441 CCGGATTCAG TCGTCACTCA TGGTGATTTT TCACTTGATA ACCTTATTTT TGACGAGGGG
1501 AAATTAATAG GTTGTATTGA TGTTGGACGA GTCGGAATCG CAGACCGATA CCAGGATCTT
1561 GCCATCCTAT GGAAGTGCCT CGGTGAGTTT TCTCCTTCAT TACAGAAACG GCTTTTTTCAA
1621 AAATATGGTA TTGATAATCC TGATATGAAT AAATTGCAGT TTCATTTGAT GCTCGATGAG
1681 TTTTCTAAT CAGAATTGGT TAATTGGTTG TAACATTATT CAGATTGGGC CCCGTTCCAC
1741 TGAGCGTCAG ACCCCGTAGA AAAGATCAAA GGATCTTCTT GAGATCCTTT TTTTCTGCGC
1801 GTAATCTGCT GCTTGCAAAC AAAAAACCA CCGCTACCAG CGGTGGTTTG TTTGCCGGAT
1861 CAAGAGCTAC CAACTCTTTT TCCGAAGGTA ACTGGCTTCA GCAGAGCGCA GATACCAAT
1921 ACTGTTCTTC TAGTGTAGCC GTAGTTAGGC CACCACTTCA AGAACTCTGT AGCACC GCCT
1981 ACATACCTCG CTCTGCTAAT CCTGTTACCA GTGGCTGCTG CCAGTGGCGA TAAGTCGTGT
2041 CTTACCGGGT TGGACTCAAG ACGATAGTTA CCGGATAAGG CGCAGCGGTC GGGCTGAACG
2101 GGGGGTTCGT GCACACAGCC CAGCTTGAG CGAACGACCT ACACCGAACT GAGATACCTA
2161 CAGCGTGAGC TATGAGAAAG CGCCACGCTT CCCGAAGGGA GAAAGGCGGA CAGGTATCCG
2221 GTAAGCGGCA GGGTCGGAAC AGGAGAGCGC ACGAGGGAGC TTCCAGGGGG AAACGCCTGG
2281 TATCTTTATA GTCCTGTCGG GTTTCGCCAC CTCTGACTTG AGCGTCGATT TTTGTGATGC
2341 TCGTCAGGGG GGCGGAGCCT ATGGAAAAAC GCCAGCAACG CGGCCTTTTT ACGGTTCTCTG
2401 GCCTTTTGCT GGCCTTTTGC TCACATGTTT TTTCTGCGT TATCCCCTGA TTCTGTGGAT
2461 AACCGTATTA CCGCTAGCAT GGATCTCGGG GACGTCTAAC TACTAAGCGA GAGTAGGGAA
2521 CTGCCAGGCA TCGAATAAAA CGAAAGGCTC AGTCGGAAGA CTGGGCCTTT CGTTTTATCT
2581 GTTGTGTTGTC GGTGAACGCT CTCCTGAGTA GGACAAATCC GCCGGGAGCG GATTTGAACG
2641 TTGTGAAGCA ACGGCCCGGA GGGTGGCGGG CAGGACGCCC GCCATAAACT GCCAGGCATC
2701 AAATAAGCA GAAGGCCATC

```

Figure 14B

Figure 15A: Cloning sites of the Entry Vector pENTR6

Int		attL1		Sph I	K2Xmn I	Sap I							
---	ttg	tac	aaa	aaa	gca	ggc	tpc	atg	cga	acc	aat	tca	gtc
---	aac	atg	tac	ttt	cgt	ccg	apc	tac	gct	tgg	tta	agt	cag
	Leu	Tyr	Lys	Lys	Ala	Gly	Cys	<u>Met</u>	Arg	Thr	Asn	Ser	Val

BamH I	Kpn I	EcoR I		EcoR I									
gac	tgg	atc	cgg	tac	cga	att	cgc	---	Death	---	aga	att	cgc
ctg	acc	tag	gac	atg	gct	taa	gcg	---	(codB)	---	tct	taa	gcg
↓	↓	↓	↓	↓									
Asp	Trp	Ile	Arg	Tyr	Arg	Ile							

Not	Xho I	EcoR I	Xba I		Int	attL2								
ggc	cgc	act	cga	gat	atc	tag	acc	cag	att	tgc	tgt	aga	dag	---
ccg	gcg	tga	gct	cta	tag	atc	tgg	gtc	gaa	aga	aca	tgt	tcc	---
↓	↓	↓	↓	↓										

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pENTR6 2717 bp

Location (Base Nos.)	Gene Encoded
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321..626	ccdB
655..754	attL2
877..1686	KmR
1791..2364	ori

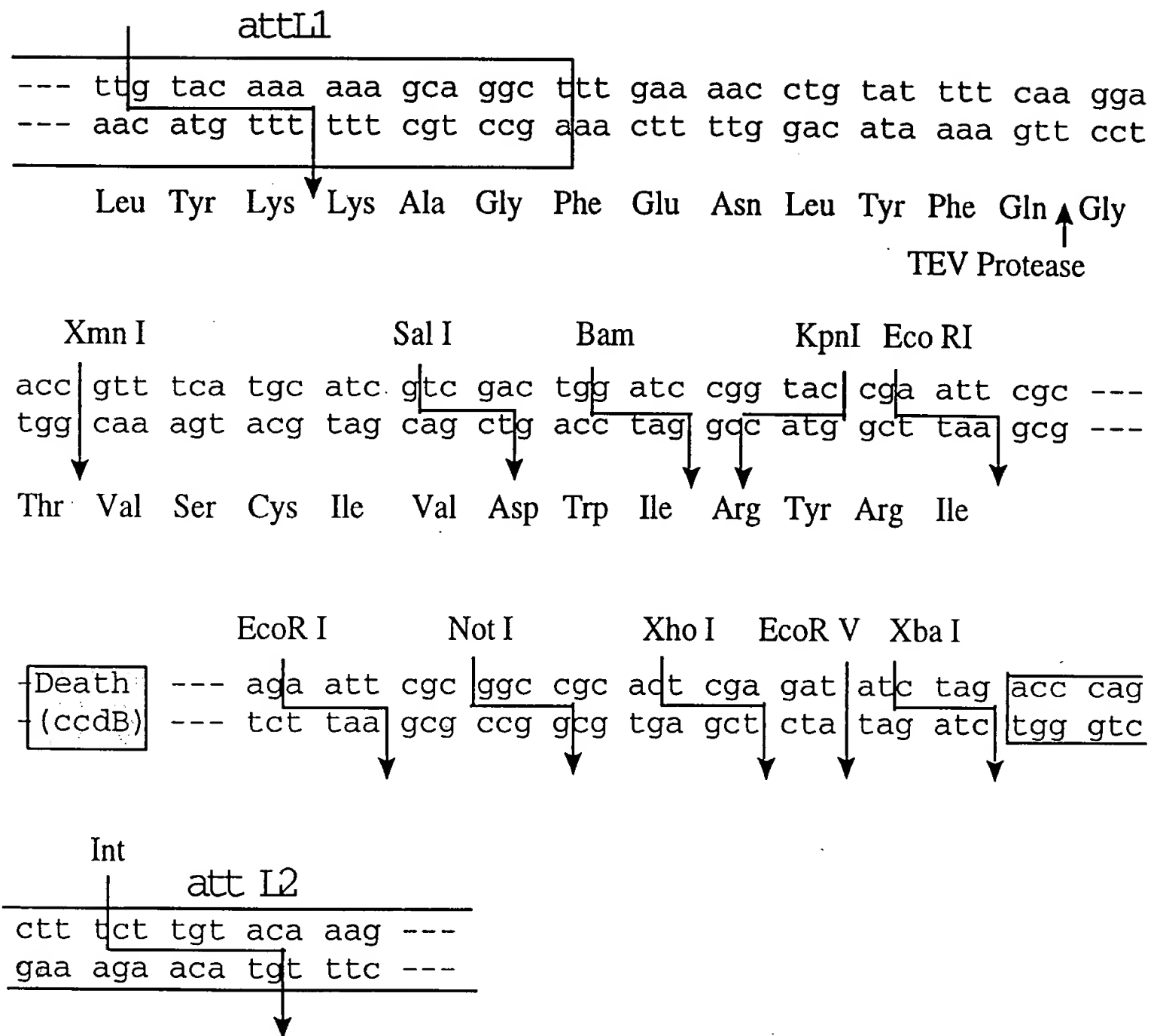
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61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTGCAT GCGAACCAAT
181 TCAGTCGACT GGATCCGGTA CCGAATTCGC TTACTAAAAG CCAGATAACA GTATGCGTAT
241 TTGCGCGCTG ATTTTTCGCG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA
301 AAAAGAGGTG TGCTTCTAGA ATGCAGTTTA AGGTTTACAC CTATAAAAGA GAGAGCCGTT
361 ATCGTCTGTT TGTGGATGTA CAGAGTGATA TTATTGACAC GCCCGGGCGA CGGATGGTGA
421 TCCCCCTGGC CAGTGCACGT CTGCTGTCAG ATAAAGTCTC CCGTGAACCT TACCCGGTGG
481 TGCATATCGG GGATGAAAGC TGGCGCATGA TGACCACCGA TATGGCCAGT GTGCCGGTCT
541 CCGTTATCGG GGAAGAAGTG GCTGATCTCA GCCACCGCGA AAATGACATC AAAAACGCCA
601 TTAACCTGAT GTTCTGGGGA ATATAGAATT CGCGGCCGCA CTCGAGATAT CTAGACCCAG
661 CTTTCTTGTA CAAAGTTGGC ATTATAAGAA AGCATTGCTT ATCAATTTGT TGCAACGAAC
721 AGGTCACTAT CAGTCAAAAT AAAATCATT TTTGCCATCC AGCTGCAGCT CTGGCCCGTG
781 TCTCAAAATC TCTGATGTTA CATTGCACAA GATAAAAATA TATCATCATG AACAATAAAA
841 CTGTCTGCTT ACATAAACAG TAATACAAGG GGTGTTATGA GCCATATTCA ACGGGAAACG
901 TCGAGGCCGC GATTAAATTC CAACATGGAT GCTGATTTAT ATGGGTATAA ATGGGCTCGC
961 GATAATGTCG GGCAATCAGG TGCACAATC TATCGCTTGT ATGGGAAGCC CGATGCGCCA
1021 GAGTTGTTTC TGAAACATGG CAAAGGTAGC GTTGCCAATG ATGTTACAGA TGAGATGGTC
1081 AGACTAAACT GGCTGACGGA ATTTATGCCT CTTCCGACCA TCAAGCATT TATCCGTACT
1141 CCTGATGATG CATGGTACT CACCACTGCG ATCCCCGAA AAACAGCATT CCAGGTATTA
1201 GAAGAATATC CTGATTCAGG TGAAAATATT GTTGATGCGC TGGCAGTGTT CCTGCGCCGG
1261 TTGCATTCGA TTCCTGTTTG TAATTGTCCT TTTAACAGCG ATCGCGTATT TCGTCTCGCT
1321 CAGGCGCAAT CACGAATGAA TAACGGTTTG GTTGATGCGA GTGATTTTGA TGACGAGCGT
1381 AATGGCTGGC CTGTTGAACA AGTCTGGAAA GAAATGCATA AACTTTTGCC ATTCTACCG
1441 GATTCAGTCG TCACTCATGG TGATTTCTCA CTTGATAACC TTATTTTGA CGAGGGGAAA
1501 TTAATAGGTT GTATTGATGT TGGACGAGTC GGAATCGCAG ACCGATACCA GGATCTTGCC
1561 ATCCTATGGA ACTGCCTCGG TGAGTTTCT CTTTCATTAC AGAAACGGCT TTTTCAAAAA
1621 TATGGTATTG ATAATCCTGA TATGAATAAA TTGCAGTTTC ATTTGATGCT CGATGAGTTT
1681 TTCTAATCAG AATTGGTTAA TTGGTTGTAA CATTATTCAG ATTGGGCCCC GTTCCACTGA
1741 GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG ATCCTTTTTT TCTGCGCGTA
1801 ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG TGGTTTGTTT GCCGGATCAA
1861 GAGCTACCAA CTCTTTTTC GAAGGTAAGT GGCTTCAGCA GAGCGCAGAT ACCAAATACT
1921 GTTCTTCTAG TGTAGCCGTA GTTAGGCCAC CACTTCAAGA ACTCTGTAGC ACCGCCTACA
1981 TACCTCGCTC TGCTAATCCT GTTACCAGTG GCTGCTGCCA GTGGCGATAA GTCGTGTCTT
2041 ACCGGGTTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC AGCGGTCGGG CTGAACGGGG
2101 GGTTCGTGCA CACAGCCCAG CTTGGAGCGA ACGACCTACA CCGAACTGAG ATACCTACAG
2161 CGTGAGCTAT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA AGGCGGACAG GTATCCGGTA
2221 AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC CAGGGGGAAA CGCCTGGTAT
2281 CTTTATAGTC CTGTCGGGTT TCGCCACCTC TGAATTGAGC GTCGATTTTT GTGATGCTCG
2341 TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG CCTTTTACG GTTCCTGGCC
2401 TTTTGCTGGC CTTTGTCTCA CATGTTCTTT CCTGCGTTAT CCCCTGATTC TGTGGATAAC
2461 CGTATTACCG CTAGCATGGA TCTCGGGGAC GTCTAACTAC TAAGCGAGAG TAGGGAACGT
2521 CCAGGCATCA AATAAAACGA AAGGCTCAGT CGGAAGACTG GGCCTTTCGT TTTATCTGTT
2581 GTTTGTCGGT GAACGCTCTC CTGAGTAGGA CAAATCCGCC GGGAGCGGAT TTGAACGTTG
2641 TGAAGCAACG GCCCGGAGGG TGGCGGGCAG GACGCCCGCC ATAAACTGCC AGGCATCAAA
2701 CTAAGCAGAA GGCCATC

```

Figure 15B

Figure 16A: Cloning sites of the Entry Vector pENTRY



pENTR7 2738 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
342..647	ccdB
676..775	attL2
898..1707	KmR
1812..2385	ori

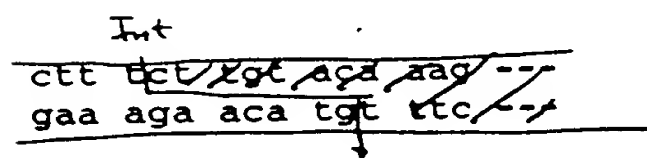
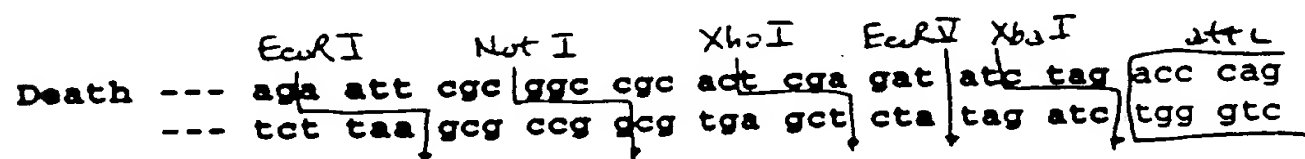
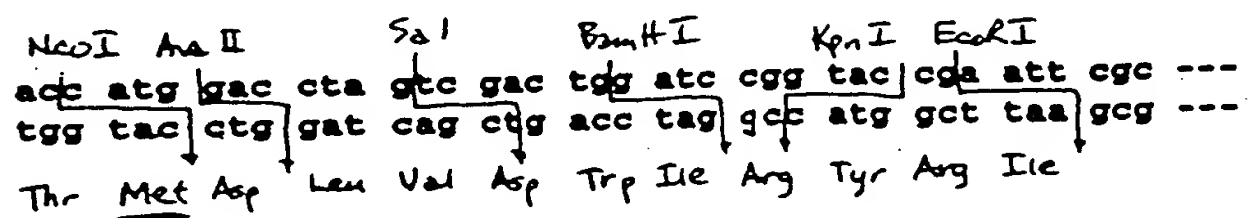
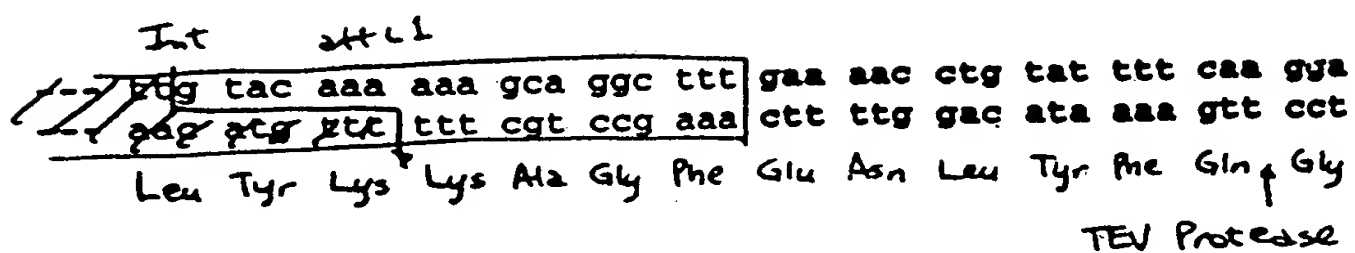
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61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTTTGA AAACCTGTAT
181 TTTCAAGGAA CCGTTTCATG CATCGTCGAC TGGATCCGGT ACCGAATTCG CTTACTAAAA
241 GCCAGATAAC AGTATGCGTA TTTGCGCGCT GATTTTTGCG GTATAAGAAT ATATACTGAT
301 ATGTATACCC GAAGTATGTC AAAAAGAGGT GTGCTTCTAG AATGCAGTTT AAGGTTTACA
361 CCTATAAAAG AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA
421 CGCCCGGGCG ACGGATAGTG ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT
481 CCCGTGAACT TTACCCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG
541 ATATGGCCAG TGTGCCGGTC TCCGTTATCG GGGAAGAAGT GGCTGATCTC AGCCACCGCG
601 AAAATGACAT CAAAAACGCC ATTAACCTGA TGTTCTGGGG AATATAGAAT TCGCGGCCGC
661 ACTCGAGATA TCTAGACCCA GCTTTCTTGT ACAAAGTTGG CATTATAAGA AAGCATTGCT
721 TATCAATTTG TTGCAACGAA CAGGTCACCTA TCAGTCAAAA TAAATCATT ATTTGCCATC
781 CAGCTGCAGC TCTGGCCCGT GTCTCAAAAT CTCTGATGTT ACATTGCACA AGATAAAAAAT
841 ATATCATCAT GAACAATAAA ACTGTCTGCT TACATAAACA GTAATACAAG GGGTGTATG
901 AGCCATATTC AACGGGAAAC GTCGAGGCCG CGATTAAATT CCAACATGGA TGCTGATTTA
961 TATGGGTATA AATGGGCTCG CGATAATGTC GGGCAATCAG GTGCGACAAT CTATCGCTTG
1021 TATGGGAAGC CCGATGCGCC AGAGTTGTTT CTGAAACATG GCAAAGGTAG CGTTGCCAAT
1081 GATGTTACAG ATGAGATGGT CAGACTAAAC TGGCTGACGG AATTTATGCC TCTTCCGACC
1141 ATCAAGCATT TTATCCGTAC TCCTGATGAT GCATGGTTAC TCACCACTGC GATCCCCGGA
1201 AAAACAGCAT TCCAGGTATT AGAAGAATAT CCTGATTCAG GTGAAAATAT TGTTGATGCG
1261 CTGGCAGTGT TCCTGCGCCG GTTGCAATTCG ATTCCTGTTT GTAATTGTCC TTTTAACAGC
1321 GATCGCGTAT TTCGTCTCGC TCAGGCGCAA TCACGAATGA ATAACGGTTT GGTGATGCG
1381 AGTGATTTTG ATGACGAGCG TAATGGCTGG CCTGTTGAAC AAGTCTGGAA AGAAATGCAT
1441 AAACTTTTGC CATTCTCACC GGATTCAGTC GTCACCTATG GTGATTTCTC ACTTGATAAC
1501 CTTATTTTTG ACGAGGGGAA ATTAATAGGT TGTATTGATG TTGGACGAGT CGGAATCGCA
1561 GACCGATACC AGGATCTTGC CATCCTATGG AACTGCCTCG GTGAGTTTTT TCCTTCATTA
1621 CAGAAACGGC TTTTTCAAAA ATATGGTATT GATAATCCTG ATATGAATAA ATTGCAGTTT
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1741 GATTGGGCCC CGTTCCACTG AGCGTCAGAC CCCGTAGAAA AGATCAAAGG ATCTTCTTGA
1801 GATCCTTTTT TTCTGCGCGT AATCTGCTGC TTGCAAACAA AAAAACCACC GCTACCAGCG
1861 GTGGTTTGTT TGCCGGATCA AGAGCTACCA ACTCTTTTTT CGAAGGTAAC TGGCTTCAGC
1921 AGAGCGCAGA TACCAAATAC TGTTCTTCTA GTGTAGCCGT AGTTAGGCCA CCACTTCAAG
1981 AACTCTGTAG CACCGCCTAC ATACCTCGCT CTGCTAATCC TGTACCAGT GGCTGCTGCC
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2101 CAGCGGTCGG GCTGAACGGG GGGTTCGTGC ACACAGCCCA GCTTGGAGCG AACGACCTAC
2161 ACCGAAGTGA GATACCTACA GCGTGAGCTA TGAGAAAGCG CCACGCTTCC CGAAGGGAGA
2221 AAGGCGGACA GGTATCCGGT AAGCGGCAGG GTCGGAACAG GAGAGCGCAC GAGGGAGCTT
2281 CCAGGGGGAA ACGCCTGGTA TCTTTATAGT CCTGTCGGGT TTCGCCACCT CTGACTTGAG
2341 CGTCGATTTT TGTGATGCTC GTCAGGGGGG CGGAGCCTAT GGAAAAACGC CAGCAACGCG
2401 GCCTTTTTTAC GGTTCCTGGC CTTTTGCTGG CTTTTTGCTC ACATGTTCTT TCCTGCGTTA
2461 TCCCCTGATT CTGTGGATAA CCGTATTACC GCTAGCATGG ATCTCGGGGA CGTCTAACTA
2521 CTAAGCGAGA GTAGGGAACG GCCAGGCATC AAATAAAACG AAAGGCTCAG TCGGAAGACT
2581 GGGCCTTTTCG TTTTATCTGT TGTTTGTCGG TGAACGCTCT CCTGAGTAGG ACAAATCCGC
2641 CGGGAGCGGA TTTGAACGTT GTGAAGCAAC GGCCCGGAGG GTGGCGGGCA GGACGCCCCG
2701 CATAAACTGC CAGGCATCAA ACTAAGCAGA AGGCCATC

```

Figure 16B

Figure 17A: Cloning Sites of the Entry Vector: pENTR8



pENTR8 2735 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..166	attL1
339..644	ccdB
673..772	attL2
895..1704	KmR
1809..2382	ori

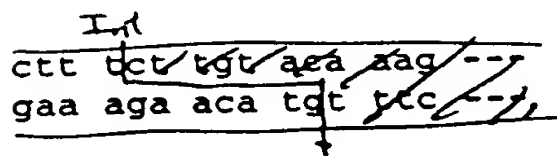
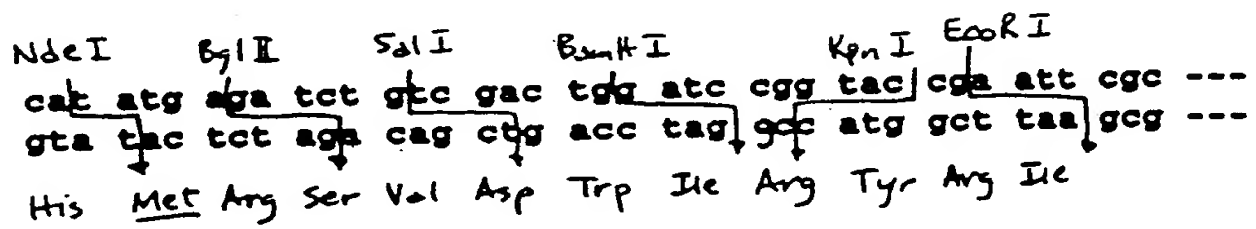
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121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTTTGA AAACCTGTAT
181 TTTCAAGGAA CCATGGACCT AGTCGACTGG ATCCGGTACC GAATTCGCTT ACTAAAAGCC
241 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA TAAGAATATA TACTGATATG
301 TATACCCGAA GTATGTCAAA AAGAGGTGTG CTTCTAGAAT GCAGTTTAAG GTTTACACCT
361 ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG TGGATGTACA GAGTGATATT ATTGACACGC
421 CCGGGCGACG GATAGTGATC CCCCTGGCCA GTGCACGTCT GCTGTCAGAT AAAGTCTCCC
481 GTGAACTTTA CCCGGTGGTG CATATCGGGG ATGAAAGCTG GCGCATGATG ACCACCGATA
541 TGGCCAGTGT GCCGGTCTCC GTTATCGGGG AAGAAGTGGC TGATCTCAGC CACCGCGAAA
601 ATGACATCAA AAACGCCATT AACCTGATGT TCTGGGGAAT ATAGAATTCTG CGGCCGCACT
661 CGAGATATCT AGACCCAGCT TTCTTGATCA AAGTTGGCAT TATAAGAAAG CATTGCTTAT
721 CAATTTGTTG CAACGAACAG GTCACTATCA GTCAAAATAA AATCATTATT TGCCATCCAG
781 CTGCAGCTCT GGCCCGTGTC TCAAAATCTC TGATGTTACA TTGCACAAGA TAAAAATATA
841 TCATCATGAA CAATAAAACT GTCTGCTTAC ATAAACAGTA ATACAAGGGG TGTTATGAGC
901 CATATTCAAC GGGAAACGTC GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTATAT
961 GGGTATAAAT GGGCTCGCGA TAATGTCGGG CAATCAGGTG CGACAATCTA TCGCTTGTAT
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1081 GTTACAGATG AGATGGTCAG ACTAAACTGG CTGACGGAAT TTATGCCTCT TCCGACCATC
1141 AAGCATTTTA TCCGTACTCC TGATGATGCA TGGTTACTCA CCACTGCGAT CCCCGGAAAA
1201 ACAGCATTCC AGGTATTAGA AGAATATCCT GATTCAGGTG AAAATATTGT TGATGCGCTG
1261 GCAGTGTCCTG TGCGCCGGTT GCATTCGATT CCTGTTTGTA ATTGTCCTTT TAACAGCGAT
1321 CGCGTATTTT GTCTCGCTCA GCGCAATCA CGAATGAATA ACGGTTTGGT TGATGCGAGT
1381 GATTTTGATG ACGAGCGTAA TGGCTGGCCT GTTGAACAAG TCTGGAAAGA AATGCATAAA
1441 CTTTTGCCAT TCTCACCAGA TTCAGTCGTC ACTCATGGTG ATTTCTCACT TGATAACCTT
1501 ATTTTGGACG AGGGGAAATT AATAGGTTGT ATTGATGTTG GACGAGTCGG AATCGCAGAC
1561 CGATACCAGG ATCTTGCCAT CCTATGGAAC TGCCTCGGTG AGTTTTCTCC TTCATTACAG
1621 AAACGGCTTT TTCAAAAATA TGGTATTGAT AATCCTGATA TGAATAAATT GCAGTTTCAT
1681 TTGATGCTCG ATGAGTTTTT CTAATCAGAA TTGGTTAATT GGTTGTAACA TTATTGAGAT
1741 TGGGCCCCGT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC TTCTTGAGAT
1801 CCTTTTTTTC TGCGCGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT ACCAGCGGTG
1861 GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAAGTGG CTTGAGCAGA
1921 GCGCAGATAC CAAATACTGT TCTTCTAGTG TAGCCGTAGT TAGGCCACCA CTTCAAGAAC
1981 TCTGTAGCAC CGCCTACATA CCTCGCTCTG CTAATCCTGT TACCAGTGGC TGCTGCCAGT
2041 GCGGATAAGT CGTGTCTTAC CGGGTTGGAC TCAAGACGAT AGTTACCGGA TAAGGCGCAG
2101 CGGTCGGGCT GAACGGGGGG TTCTGTCACA CAGCCCAGCT TGGAGCGAAC GACCTACACC
2161 GAACTGAGAT ACCTACAGCG TGAGCTATGA GAAAGCGCCA CGCTTCCCGA AGGGAGAAAG
2221 GCGGACAGGT ATCCGGTAAG CGGCAGGGTC GGAACAGGAG AGCGCACGAG GGAGCTTCCA
2281 GGGGGAAACG CCTGGTATCT TTATAGTCCT GTCGGGTTTC GCCACCTCTG ACTTGAGCGT
2341 CGATTTTGTG GATGCTCGTC AGGGGGGCGG AGCCTATGGA AAAACGCCAG CAACGCGGCC
2401 TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTTCTTTCC TCGGTTATCC
2461 CCTGATTCTG TGGATAACCG TATTACCGCT AGCATGGATC TCGGGGACGT CTAATACTA
2521 AGCGAGAGTA GGGAACTGCC AGGCATCAAA TAAACGAAA GGCTCAGTCG GAAGACTGGG
2581 CCTTTCGTTT TATCTGTTGT TTGTCGGTGA ACGCTCTCCT GAGTAGGACA AATCCGCCGG
2641 GAGCGGATTT GAACGTTGTG AAGCAACGGC CCGGAGGGTG GCGGGCAGGA CGCCCGCCAT
2701 AAAGTGCCAG GCATCAAACT AAGCAGAAGG CCATC

```

FIGURE 17B

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
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pENTR9 2735 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
339..644	ccdB
673..772	attL2
895..1704	KmR
1809..2382	ori

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1 CTGACGGATG GCCTTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTTTGA AAACCTGTAT
181 TTTCAAGGAC ATATGAGATC TGTCGACTGG ATCCGGTACC GAATTCGCTT ACTAAAAGCC
241 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGC GGTA TAAGAATATA TACTGATATG
301 TATACCCGAA GTATGTCAAA AAGAGGTGTG CTTCTAGAAT GCAGTTTAAG GTTTACACCT
361 ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG TGGATGTACA GAGTGATATT ATTGACACGC
421 CCGGGCGACG GATAGTGATC CCCCTGGCCA GTGCACGTCT GCTGTCAGAT AAAGTCTCCC
481 GTGAACTTTA CCCGGTGGTG CATATCGGGG ATGAAAGCTG GCGCATGATG ACCACCGATA
541 TGGCCAGTGT GCCGGTCTCC GTTATCGGGG AAGAAGTGGC TGATCTCAGC CACCGCGAAA
601 ATGACATCAA AAACGCCATT AACCTGATGT TCTGGGGAAT ATAGAATTCTG CGGCCGCACT
661 CGAGATATCT AGACCCAGCT TTCTTGTTACA AAGTTGGCAT TATAAGAAAG CATTGCTTAT
721 CAATTTGTTG CAACGAACAG GTCACATCA GTCAAAATAA AATCATTATT TGCCATCCAG
781 CTGCAGCTCT GGCCCGTGTC TCAAAATCTC TGATGTTACA TTGCACAAGA TAAAAATATA
841 TCATCATGAA CAATAAAACT GTCTGCTTAC ATAAACAGTA ATACAAGGGG TGTTATGAGC
901 CATATTCAAC GGGAAACGTC GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTATAT
961 GGGTATAAAT GGGCTCGCGA TAATGTCGGG CAATCAGGTG CGACAATCTA TCGCTTGTAT
1021 GGGGAAGCCCG ATGCGCCAGA GTTGTTTCTG AAACATGGCA AAGGTAGCGT TGCCAATGAT
1081 GTTACAGATG AGATGGTCAG ACTAACTGG CTGACGGAAT TTATGCCTCT TCCGACCATC
1141 AAGCATTTTA TCCGTACTCC TGATGATGCA TGGTTACTCA CCACTGCGAT CCCCAGAAAA
1201 ACAGCATTCC AGGTATTAGA AGAATATCCT GATTGAGGTG AAAATATTGT TGATGCGCTG
1261 GCAGTGTCCC TGCGCCGGTT GCATTCGATT CCTGTTTGTG ATTGTCCTTT TAACAGCGAT
1321 CGCGTATTTT GTCTCGCTCA GGCGCAATCA CGAATGAATA ACGGTTTGGT TGATGCGAGT
1381 GATTTTGATG ACGAGCGTAA TGGCTGGCCT GTTGAACAAG TCTGGAAAGA AATGCATAAA
1441 CTTTTGCCAT TCTCACCAGA TTCAGTCGTC ACTCATGGTG ATTTCTCACT TGATAACCTT
1501 ATTTTGTGAC AGGGGAAATT AATAGGTTGT ATTGATGTTG GACGAGTCGG AATCGCAGAC
1561 CGATACCAGG ATCTTGCCAT CCTATGGAAC TGCCTCGGTG AGTTTTCTCC TTCATTACAG
1621 AAACGGCTTT TTCAAAAATA TGGTATTGAT AATCCTGATA TGAATAAATT GCAGTTTCAT
1681 TTGATGCTCG ATGAGTTTTT CTAATCAGAA TTGGTTAATT GGTGTAACA TTATTCAGAT
1741 TGGGCCCCGT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC TTCTTGAGAT
1801 CCTTTTTTTC TGCGCGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT ACCAGCGGTG
1861 GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAAGTGG CTTAGCAGAG
1921 GCGCAGATAC CAAATACTGT TCTTCTAGTG TAGCCGTAGT TAGGCCACCA CTTCAAGAAC
1981 TCTGTAGCAC CGCCTACATA CCTCGCTCTG CTAATCCTGT TACCAGTGGC TGCTGCCAGT
2041 GGCATAAGT CGTGTCTTAC CGGGTTGGAC TCAAGACGAT AGTTACCGGA TAAGGCGCAG
2101 CGGTCGGGCT GAACGGGGGG TTCGTGCACA CAGCCCAGCT TGGAGCGAAC GACCTACACC
2161 GAACTGAGAT ACCTACAGCG TGAGCTATGA GAAAGCGCCA CGCTTCCCGA AGGGAGAAAG
2221 GCGGACAGGT ATCCGGTAAG CGGCAGGGTC GGAACAGGAG AGCGCACGAG GGAGCTTCCA
2281 GGGGGAAACG CCTGGTATCT TTATAGTCCT GTCGGGTTTC GCCACCTCTG ACTTGAGCGT
2341 CGATTTTTGT GATGCTCGTC AGGGGGGCGG AGCCTATGGA AAAACGCCAG CAACGCGGCC
2401 TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTTCTTTCC TGCCTTATCC
2461 CCTGATTCTG TGGATAACCG TATTACCGCT AGCATGGATC TCGGGGACGT CTAACCTACTA
2521 AGCGAGAGTA GGGAAGTACC AGGCATCAAA TAAACGAAA GGCTCAGTCG GAAGACTGGG
2581 CCTTTCGTTT TATCTGTTGT TTGTCGGTGA ACGCTCTCCT GAGTAGGACA AATCCGCCGG
2641 GAGCGGATTT GAACGTTGTG AAGCAACGGC CCGGAGGGTG GCGGGCAGGA CGCCCGCCAT
2701 AACTGCCAG GCATCAAACT AAGCAGAAGG CCATC

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FIGURE 18B

pENTR10 2738 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
342..647	ccdB
676..775	attL2
898..1707	KmR
1812..2385	ori

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1 CTGACGGATG GCCTTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTTCGA ACTAAGGAAA
181 TACTTACATA TGGGAACCAA TTCAGTCGAC TGGATCCGGT ACCGAATTCG CTTACTAAAA
241 GCCAGATAAC AGTATGCGTA TTTGCGCGCT GATTTTTTGC GTATAAGAAT ATATACTGAT
301 ATGTATACCC GAAGTATGTC AAAAAGAGGT GTGCTTCTAG AATGCAGTTT AAGGTTTACA
361 CCTATAAAAG AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA
421 CGCCCGGGCG ACGGATGGTG ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT
481 CCCGTGAACT TTACCCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG
541 ATATGGCCAG TGTGCCGGTC TCCGTTATCG GGGAAGAAGT GGCTGATCTC AGCCACCGCG
601 AAAATGACAT CAAAAACGCC ATTAACCTGA TGTTCTGGGG AATATAGAAT TCGCGGCCGC
661 ACTCGAGATA TCTAGACCCA GCTTCTTGT ACAAAGTTGG CATTATAAGA AAGCATTGCT
721 TATCAATTTG TTGCAACGAA CAGGTCAC TAAGTCAAAA TAAATTCATT ATTTGCCATC
781 CAGCTGCAGC TCTGGCCCGT GTCTCAAAAT CTCTGATGTT ACATTGCACA AGATAAAAAT
841 ATATCATCAT GAACAATAAA ACTGTCTGCT TACATAAACA GTAATACAAG GGGTGTATG
901 AGCCATATTC AACGGGAAAC GTCGAGGCCG CGATTAAATT CCAACATGGA TGCTGATTTA
961 TATGGGTATA AATGGGCTCG CGATAATGTC GGGCAATCAG GTGCGACAAT CTATCGCTTG
1021 TATGGGAAGC CCGATGCGCC AGAGTTGTTT CTGAAACATG GCAAAGGTAG CGTTGCCAAT
1081 GATGTTACAG ATGAGATGGT CAGACTAAAC TGGCTGACGG AATTTATGCC TCTTCCGACC
1141 ATCAAGCATT TTATCCGTAC TCCTGATGAT GCATGGTTAC TCACCACTGC GATCCCCGGA
1201 AAAACAGCAT TCCAGGTATT AGAAGAATAT CCTGATTCAG GTGAAAATAT TGTTGATGCG
1261 CTGGCAGTGT TCCTGCGCCG GTTGCAATCG ATTCCTGTTT GTAATTGTCC TTTTAACAGC
1321 GATCGCGTAT TTCGTCTCGC TCAGGCGCAA TCACGAATGA ATAACGGTTT GGTGATGCG
1381 AGTGATTTTG ATGACGAGCG TAATGGCTGG CCTGTTGAAC AAGTCTGGAA AGAAATGCAT
1441 AACTTTTTGC CATTCTCACC GGATTTCAGT GTCACCTCAT GTGATTTCTC ACTTGATAAC
1501 CTTATTTTTG ACGAGGGGAA ATTAATAGGT TGTATTGATG TTGGACGAGT CGGAATCGCA
1561 GACCGATACC AGGATCTTGC CATCCTATGG AACTGCCTCG GTGAGTTTTT TCCTTCATTA
1621 CAGAAACGGC TTTTCAAAA ATATGGTATT GATAATCCTG ATATGAATAA ATTGCAGTTT
1681 CATTTGATGC TCGATGAGTT TTTCTAATCA GAATTGGTTA ATTGGTTGTA ACATTATTCA
1741 GATTGGGCCC CGTTCCACTG AGCGTCAGAC CCCGTAGAAA AGATCAAAGG ATCTTCTTGA
1801 GATCCTTTTT TTCTGCGCGT AATCTGCTGC TTGCAAACAA AAAAACCACC GCTACCAGCG
1861 GTGGTTTGTT TGCCGGATCA AGAGCTACCA ACTCTTTTTT CGAAGGTAAC TGGCTTCAGC
1921 AGAGCGCAGA TACCAAATAC TGTTCTTCTA GTGTAGCCGT AGTTAGGCCA CCACTTCAAG
1981 AACTCTGTAG CACCGCCTAC ATACCTCGCT CTGCTAATCC TGTTACCAGT GGCTGCTGCC
2041 AGTGGCGATA AGTCGTGTCT TACCGGGTTG GACTCAAGAC GATAGTTACC GGATAAGGCG
2101 CAGCGGTCGG GCTGAACGGG GGGTTCGTGC ACACAGCCCA GCTTGAGCGG AACGACCTAC
2161 ACCGAACTGA GATACCTACA GCGTGAGCTA TGAGAAAGCG CCACGCTTCC CGAAGGGAGA
2221 AAGGCGGACA GGTATCCGGT AAGCGGCAGG GTCGGAACAG GAGAGCGCAC GAGGGAGCTT
2281 CCAGGGGGAA ACGCCTGGTA TCTTTATAGT CCTGTCGGGT TTCGCCACCT CTGACTTGAG
2341 CGTCGATTTT TGTGATGCTC GTCAGGGGGG CGGAGCCTAT GGAAAAACGC CAGCAACGCG
2401 GCCTTTTTTAC GGTTCCTGGC CTTTGTGCTG CCTTTTGCTC ACATGTTCTT TCCTGCGTTA
2461 TCCCCTGATT CTGTGGATAA CCGTATTACC GCTAGCATGG ATCTCGGGGA CGTCTAACTA
2521 CTAAGCGAGA GTAGGGAACG GCCAGGCATC GAATAAAACG AAAGGCTCAG TCGGAAGACT
2581 GGGCCTTTTCG TTTTATCTGT TGTTTGTGCG TGAACGCTCT CCTGAGTAGG ACAAATCCGC
2641 CGGGAGCGGA TTTGAACGTT GTGAAGCAAC GGCCCGGAGG GTGGCGGGCA GGACGCCCGC
2701 CATAAACTGC CAGGCATCAA ACTAAGCAGA AGGCCATC

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FIGURE 19B

Figure 20A: Cloning Sites of the Entry Vector pENTR11

Int	attL1		S.D.			Kozak		XmnI	S.D.								
TTG	TAC	AAA	AAA	GCA	GGC	TTC	GAA	GGA	GAT	AGA	ACC	AAT	TCT	CTA	AGG	AAA	TAC
AAC	ATG	TTT	TTT	CGT	CCG	AAG	CTT	CCT	CTA	TCT	TGG	TTA	AGA	GAT	TCC	TTT	ATG
Leu	Tyr	Lys	Lys	Ala	Gly	Phe	Glu	Gly	Asp	Arg	Thr	Asn	Ser	Leu	Arg	Lys	Tyr

Kozak	NcoI	SalI	BamHI		KpnI		EcoRI	EcoRI		NotI							
TTA	ACC	ATG	GTC	GAC	TGG	ATC	CGG	TAC	CGA	ATT	C--	ccdB	--G	AAT	TCG	CGG	CCG
AAT	TGG	TAC	CAG	CTG	ACC	TAG	GCC	ATG	GCT	TAA	G		C	TTA	AGC	GCC	GGC
Leu	Thr	Met	Val	Asp	Trp	Ile	Arg	Tyr	Arg	Ile				Asn	Ser	Arg	Pro

XhoI	EcoRV		XbaI	Int		attL2						
CAC	TCG	AGA	TAT	CTA	GAC	CCA	GCT	TTC	TTG	TAC	AAA	G
GTG	AGC	TCT	ATA	GAT	CTG	GGT	CGA	AAG	AAC	ATG	TTT	C
His	Ser	Arg	Tyr	Leu	Asp	Pro	Ala	Phe	Leu	Tyr	Lys	

pENTR11 2744 bp (rotated to position 2578)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..166	attL1
348..653	ccdB
683..781	attL2
904..1713	KmR
1818..2391	ori

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1 CTGACGGATG GCCTTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTTCGA AGGAGATAGA
181 ACCAATTCTC TAAGGAAATA CTTAACCATG GTCGACTGGA TCCGGTACCG AATTCGCTTA
241 CTAAAAGCCA GATAACAGTA TGCGTATTTG CGCGCTGATT TTTGCGGTAT AAGAATATAT
301 ACTGATATGT ATACCCGAAG TATGTCAAAA AGAGGTGTGC TTCTAGAATG CAGTTTAAGG
361 TTTACACCTA TAAAAGAGAG AGCCGTATATC GTCTGTTTGT GGATGTACAG AGTGATATTA
421 TTGACACGCC CGGGCGACGG ATAGTGATCC CCCTGGCCAG TGCACGTCTG CTGTCAGATA
481 AAGTCTCCCG TGAACTTTAC CCGGTGGTGC ATATCGGGGA TGAAAGCTGG CGCATGATGA
541 CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA AGAAGTGGCT GATCTCAGCC
601 ACCGCGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT CTGGGGAATA TAGAATTCGC
661 GGCCGCACTC GAGATATCTA GACCCAGCTT TCTTGTACAA AGTTGGCATT ATAAGAAAGC
721 ATTGCTTATC AATTTGTTGC AACGAACAGG TCACTATCAG TCAAAATAAA ATCATTATTT
781 GCCATCCAGC TGCAGCTCTG GCCCGTGTCT CAAAATCTCT GATGTTACAT TGCACAAGAT
841 AAAAATATAT CATCATGAAC AATAAACTG TCTGCTTACA TAAACAGTAA TACAAGGGGT
901 GTTATGAGCC ATATTCAACG GGAAACGTCG AGGCCGCGAT TAAATTCCAA CATGGATGCT
961 GATTTATATG GGTATAAATG GGCTCGCGAT AATGTCGGGC AATCAGGTGC GACAATCTAT
1021 CGCTTGATATG GGAAGCCCGA TGCGCCAGAG TTGTTTCTGA AACATGGCAA AGGTAGCGTT
1081 GCCAATGATG TTACAGATGA GATGGTCAGA CTAAACTGGC TGACGGAATT TATGCCTCTT
1141 CCGACCATCA AGCATTTTAT CCGTACTCCT GATGATGCAT GGTTACTCAC CACTGCGATC
1201 CCCGGAAAAA CAGCATTCCA GGTATTAGAA GAATATCCTG ATTCAGGTGA AAATATTGTT
1261 GATGCGCTGG CAGTGTTTCT GCGCCGGTTG CATTGATTC CTGTTTGTAA TTGTCCTTTT
1321 AACAGCGATC GCGTATTTCT TCTCGCTCAG GCGCAATCAC GAATGAATAA CGGTTTGGTT
1381 GATGCGAGTG ATTTTGATGA CGAGCGTAAT GGCTGGCCTG TTGAACAAGT CTGGAAAGAA
1441 ATGCATAAAC TTTTGCCATT CTCACCGGAT TCAGTCGTCA CTCATGGTGA TTTCTCACTT
1501 GATAACCTTA TTTTGTGACGA GGGGAAATTA ATAGGTGTGA TTGATGTTGG ACGAGTCGGA
1561 ATCGCAGACC GATACCAGGA TCTTGCCATC CTATGGAAC GCCTCGGTGA GTTTTCTCCT
1621 TCATTACAGA AACGGCTTTT TCAAAAATAT GGTATTGATA ATCCTGATAT GAATAAATTG
1681 CAGTTTCATT TGATGCTCGA TGAGTTTTC TAATCAGAAT TGGTTAATTG GTTGTAACAT
1741 TATTCAGATT GGGCCCCGTT CCACTGAGCG TCAGACCCCG TAGAAAAGAT CAAAGGATCT
1801 TCTTGAGATC CTTTTTTTCT GCGCGTAATC TGCTGCTTGC AAACAAAAAA ACCACCGCTA
1861 CCAGCGGTGG TTTGTTTGCC GGATCAAGAG CTACCAACTC TTTTCCGAA GGTAAGTGGC
1921 TTCAGCAGAG CGCAGATACC AAATACTGTT CTTCTAGTGT AGCCGTAGTT AGGCCACCAC
1981 TTCAAGAACT CTGTAGCACC GCCTACATAC CTCGCTCTGC TAATCCTGTT ACCAGTGGCT
2041 GCTGCCAGTG GCGATAAGTC GTGTCTTACC GGGTTGGACT CAAGACGATA GTTACCGGAT
2101 AAGGCGCAGC GGTGCGGCTG AACGGGGGGT TCGTGACAC AGCCCAGCTT GGAGCGAACG
2161 ACCTACACCG AACTGAGATA CCTACAGCGT GAGCTATGAG AAAGCGCCAC GCTTCCCGAA
2221 GGGAGAAAGG CGGACAGGTA TCCGGTAAGC GGCAGGGTCG GAACAGGAGA GCGCACGAGG
2281 GAGCTTCCAG GGGGAAACGC CTGGTATCTT TATAGTCCTG TCGGGTTTCG CCACCTCTGA
2341 CTTGAGCGTC GATTTTTTGTG ATGCTCGTCA GGGGGGCGGA GCCTATGGAA AAACGCCAGC
2401 AACGCGGCCT TTTTACGGTT CCTGGCCTTT TGCTGGCCTT TTGCTCACAT GTTCTTTTCT
2461 GCGTTATCCC CTGATTCTGT GGATAACCGT ATTACCGCTA GCATGGATCT CGGGGACGTC
2521 TAACTACTAA GCGAGAGTAG GGAAGTCCA GGCATCAAAT AAAACGAAAG GCTCAGTCGG
2581 AAGACTGGGC CTTTCGTTTT ATCTGTTGTT TGTCGGTGAA CGCTCTCCTG AGTAGGACAA
2641 ATCCGCCGGG AGCGGATTTG AACGTTGTGA AGCAACGGCC CGGAGGGTGG CGGGCAGGAC
2701 GCCCGCCATA AACTGCCAGG CATCAAATA AGCAGAAGGC CATC

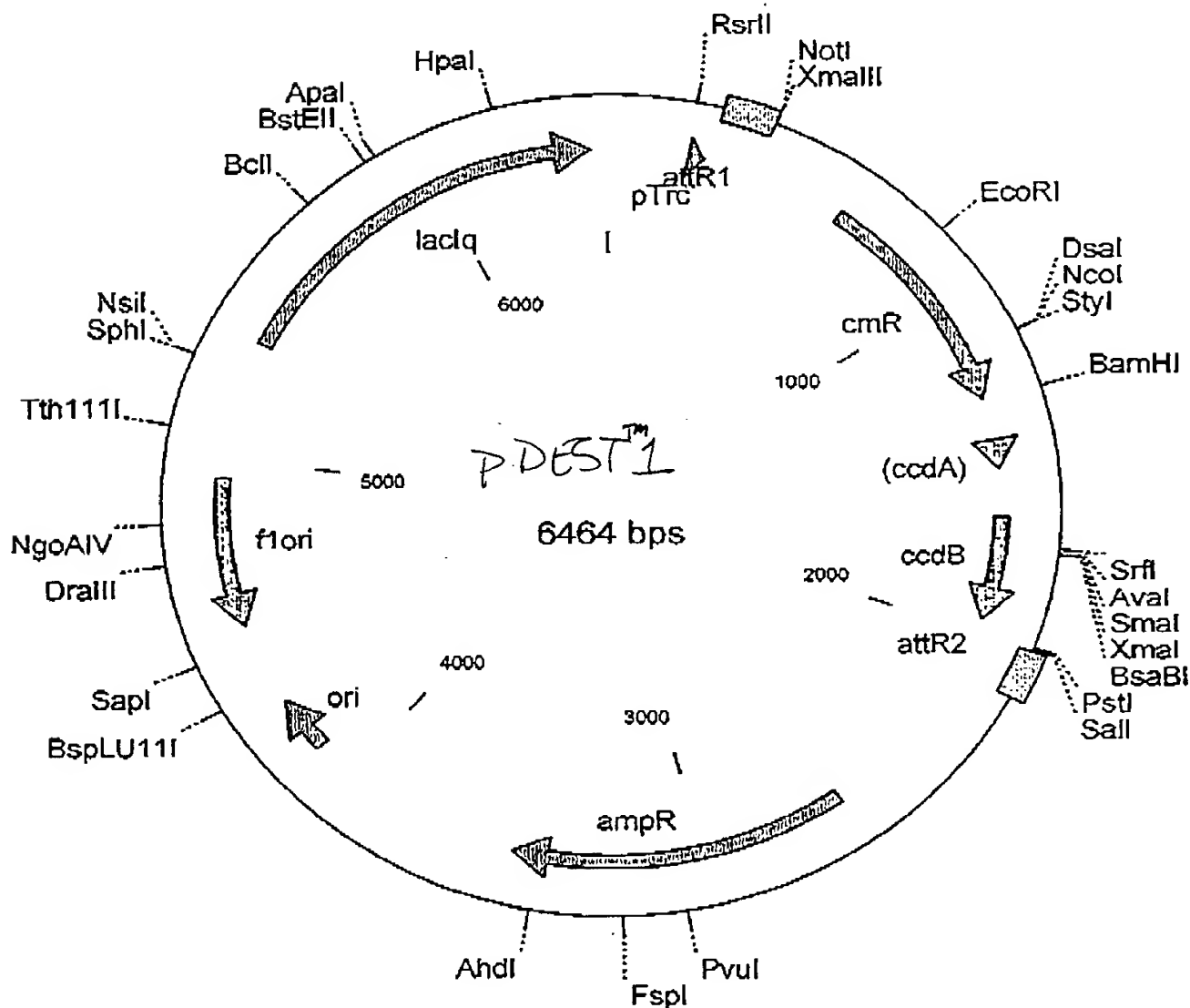
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FIGURE 20B

Figure 2/A: pDEST1

Native Protein Expression in E. coli

1 atgagctg ⁻³⁵ gacgattaat ^{Tre promoter} catccggctc ⁻¹⁰ gtataat ^{RNA} tggaattgtg agcggataac
tactcgacaa ctgttaatta gtaggccgag catattacac accttaacac tcgcctattg
61 aatttcacac aggaaacaga caggtatagg atcacaagtt gtgagaaada agctgaagga
ttaaagtgtg tcctttgtct gtccatatcc tag gttcaa acatgtt tcgattt gct



pDEST1 6464 bp

Location (Base Nos.)	Gene Encoded
216..257	Trc promoter
397..273	attR1
647..1306	CmR
1426..1510	inactivated ccdA
1648..1953	ccdB
1994..2118	attR2
2598..3503	ampR
4104..4264	ori
4504..4941	flori (f1 intergenic region)
5340..6420	lacIq

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1  GTTTGACAGC TTATCATCGA CTGCACGGTG CACCAATGCT TCTGGCGTCA GGCAGCCATC
61  GGAAGCTGTG GTATGGCTGT GCAGGTCGTA AATCACTGCA TAATTCGTGT CGCTCAAGGC
121 GCACTCCCGT TCTGGATAAT GTTTTTTTGCG CCGACATCAT AACGGTTCTG GCAAATATTC
181 TGAAATGAGC TGTTGACAAT TAATCATCCG GTCCGTATAA TCTGTGGAAT TGTGAGCGGG
241 ATAACAATTT CATCGCGAGG TACCAAGCTA TCACAAGTTT GTACAAAAAA GCTGAACGAG
301 AAACGTAAAA TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA
361 CATAATACTG TAAACACAA CATATCCAGT CACTATGGCG GCCGCTAAGT TGGCAGCATC
421 ACCCGACGCA CTTTGCGCCG AATAAATACC TGTGACGGAA GATCACTTCG CAGAATAAAT
481 AAATCCTGGT GTCCCTGTTG ATACCGGGAA GCCCTGGGCC AACTTTTGGC GAAAATGAGA
541 CGTTGATCGG CACGTAAGAG GTTCCAACCT TCACCATAAT GAAATAAGAT CACTACCGGG
601 CGTATTTTTT GAGTTATCGA GATTTTCAGG AGCTAAGGAA GCTAAAATGG AGAAAAAAT
661 CACTGGATAT ACCACCGTTG ATATATCCCA ATGGCATCGT AAAGAACATT TTGAGGCATT
721 TCAGTCAGTT GCTCAATGTA CCTATAACCA GACCGTTCAG CTGGATATTA CGGCCTTTTT
781 AAAGACCGTA AAGAAAAATA AGCACAAGTT TTATCCGGCC TTTATTCACA TTCTTGCCCG
841 CCTGATGAAT GCTCATCCGG AATTCGGTAT GGCAATGAAA GACGGTGAGC TGGTGATATG
901 GGATAGTGTT CACCCTTGTT ACACCGTTTT CCATGAGCAA ACTGAAACGT TTTCATCGCT
961 CTGGAGTGAA TACCACGACG ATTTCCGGCA GTTTCTACAC ATATATTTCG AAGATGTGGC
1021 GTGTTACGGT GAAAACCTGG CCTATTTCCT TAAAGGGTTT ATTGAGAATA TGTTTTTTCG
1081 CTCAGCCAAT CCCTGGGTGA GTTTCACCAG TTTTGATTTA AACGTGGCCA ATATGGACAA
1141 CTTCTTCGCC CCCGTTTTCA CCATGGGCAA ATATTATACG CAAGGCGACA AGGTGCTGAT
1201 GCCGCTGGCG ATTCAGGTTT ATCATGCCGT CTGTGATGGC TTCCATGTCG GCAGAATGCT
1261 TAATGAATTA CAACAGTACT GCGATGAGTG GCAGGGCGGG GCGTAAACGC GTGGATCCCG
1321 CTTACTAAAA GCCAGATAAC AGTATGCGTA TTTGCGCGCT GATTTTTGCG GTATAAGAAT
1381 ATATACTGAT ATGTATACCC GAAGTATGTC AAAAAGAGGT GTGCTATGAA GCAGCGTATT
1441 ACAGTGACAG TTGACAGCGA CAGCTATCAG TTGCTCAAGG CATATATGAT GTCAATATCT
1501 CCGGTCTGGT AAGCACAACC ATGCAGAATG AAGCCCGTCG TCTGCGTGCC GAACGCTGGA
1561 AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG TCGCCCGGTT TATTGAAATG AACGGCTCTT
1621 TTGCTGACGA GAACAGGGAC TGGTGAAATG CAGTTTAAGG TTTACACCTA TAAAAGAGAG
1681 AGCCGTTATC GTCTGTTTGT GGATGTACAG AGTGATATTA TTGACACGCC CGGGCGACGG
1741 ATGGTGATCC CCCTGGCCAG TGCACGTCTG CTGTCAGATA AAGTCTCCCG TGAACCTTAC
1801 CCGGTGGTGC ATATCGGGGA TGAAAGCTGG CGCATGATGA CCACCGATAT GGCCAGTGTG
1861 CCGGTCTCCG TTATCGGGGA AGAAGTGGCT GATCTCAGCC ACCGCGAAAA TGACATCAAA
1921 AACGCCATTA ACCTGATGTT CTGGGGAATA TAAATGTCAG GCTCCCTTAT ACACAGCCAG
1981 TCTGCAGGTC GACCATAGTG ACTGGATATG TTGTGTTTTA CAGTATTATG TAGTCTGTTT
2041 TTTATGCAAA ATCTAATTTA ATATATTGAT ATTTATATCA TTTTACGTTT CTCGTTCAGC
2101 TTTCTTGTAC AAAGTGGTGA TAGCTTGGCT GTTTTGGCGG ATGAGAGAAG ATTTTCAGCC
2161 TGATACAGAT TAAATCAGAA CGCAGAAGCG GTCTGATAAA ACAGAATTTG CCTGGCGGCA
2221 GTAGCGCGGT GGTCCCACCT GACCCCATGC CGAACTCAGA AGTGAAACGC CGTAGCGCCG
2281 ATGGTAGTGT GGGGTCTCCC CATGCGAGAG TAGGGAACCTG CCAGGCATCA AATAAACGA
2341 AAGGCTCAGT CGAAAGACTG GGCCTTTCGT TTTATCTGTT GTTTGTCTGGT GAACGCTCTC
2401 CTGAGTAGGA CAAATCCGCC GGGAGCGGAT TTGAACGTTG CGAAGCAACG GCCCGGAGGG
2461 TGGCGGGCAG GACGCCCGCC ATAAACTGCC AGGCATCAAA TTAAGCAGAA GGCCATCCTG
2521 ACGGATGGCC TTTTGTGCTT TCTACAAACT CTTTTTGTTT ATTTTCTAA ATACATTCAA-

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FIGURE 21B

2581	ATATGTATCC	GCTCATGAGA	CAATAACCCT	GATAAATGCT	TCAATAATAT	TGAAAAAGGA
2641	AGAGTATGAG	TATTCAACAT	TTCCGTGTCTG	CCCTTATTCC	CTTTTTTTGCG	GCATTTTGCC
2701	TTCTGTGTTT	TGCTCACCCA	GAAACGCTGG	TGAAAGTAAA	AGATGCTGAA	GATCAGTTGG
2761	GTGCACGAGT	GGGTACATC	GAACGTGATC	TCAACAGCGG	TAAGATCCTT	GAGAGTTTTC
2821	GCCCCGAAGA	ACGTTTTCCA	ATGATGAGCA	CTTTTAAAGT	TCTGCTATGT	GGCGCGGTAT
2881	TATCCCGTGT	TGACGCCGGG	CAAGAGCAAC	TCGGTCGCCG	CATACACTAT	TCTCAGAATG
2941	ACTTGTTTGA	GTACTCACCA	GTCACAGAAA	AGCATCTTAC	GGATGGCATG	ACAGTAAGAG
3001	AATTATGCAG	TGCTGCCATA	ACCATGAGTG	ATAACACTGC	GGCCAACCTA	CTTCTGACAA
3061	CGATCGGAGG	ACCGAAGGAG	CTAACCGCTT	TTTTGCACAA	CATGGGGGAT	CATGTAAGTC
3121	GCCTTGATCG	TTGGGAACCG	GAGCTGAATG	AAGCCATACC	AAACGACGAG	CGTGACACCA
3181	CGATGCCTAC	AGCAATGGCA	ACAACGTTGC	GCAAACCTATT	AACTGGCGAA	CTACTTACTC
3241	TAGCTTCCCG	GCAACAATTA	ATAGACTGGA	TGGAGGCGGA	TAAAGTTGCA	GGACCACTTC
3301	TGCGCTCGGC	CCTTCCGGCT	GGCTGGTTTA	TTGCTGATAA	ATCTGGAGCC	GGTGAGCGTG
3361	GGTCTCGCGG	TATCATTGCA	GCACTGGGGC	CAGATGGTAA	GCCCTCCCGT	ATCGTAGTTA
3421	TCTACACGAC	GGGGAGTCAG	GCAACTATGG	ATGAACGAAA	TAGACAGATC	GCTGAGATAG
3481	GTGCCTCACT	GATTAAGCAT	TGGTAACTGT	CAGACCAAGT	TTACTCATAT	ATACTTTAGA
3541	TTGATTTAAA	ACTTCATTTT	TAATTTAAAA	GGATCTAGGT	GAAGATCCTT	TTTGATAATC
3601	TCATGACCAA	AATCCCTTAA	CGTGAGTTTT	CGTTCCACTG	AGCGTCAGAC	CCCGTAGAAA
3661	AGATCAAAGG	ATCTTCTTGA	GATCCTTTTT	TTCTGCGCGT	AATCTGCTGC	TTGCAAACAA
3721	AAAAACCACC	GCTACCAGCG	GTGGTTTGTT	TGCCGGATCA	AGAGCTACCA	ACTCTTTTTC
3781	CGAAGGTAAC	TGGCTTCAGC	AGAGCGCAGA	TACCAAATAC	TGTCCTTCTA	GTGTAGCCGT
3841	AGTTAGGCCA	CCACTTCAAG	AACTCTGTAG	CACCGCCTAC	ATACCTCGCT	CTGCTAATCC
3901	TGTTACCAGT	GGCTGCTGCC	AGTGGCGATA	AGTCGTGTCT	TACCGGGTTG	GACTCAAGAC
3961	GATAGTTACC	GGATAAGGCG	CAGCGGTCGG	GCTGAACGGG	GGGTTCGTGC	ACACAGCCCA
4021	GCTTGAGCGG	AACGACCTAC	ACCGAACTGA	GATACCTACA	GCGTGAGCTA	TGAGAAAGCG
4081	CCACGCTTCC	CGAAGGGAGA	AAGGCGGACA	GGTATCCGGT	AAGCGGCAGG	GTCGGAACAG
4141	GAGAGCGCAC	GAGGGAGCTT	CCAGGGGGAA	ACGCCTGGTA	TCTTTATAGT	CCTGTCGGGT
4201	TTCCGCCACCT	CTGACTTGAG	CGTCGATTTT	TGTGATGCTC	GTCAGGGGGG	CGGAGCCTAT
4261	GGAAAAACGC	CAGCAACGCG	GCCTTTTTTAC	GGTTCCTGGC	CTTTTGCTGG	CCTTTTGCTC
4321	ACATGTTCTT	TCCTGCGTTA	TCCCCTGATT	CTGTGGATAA	CCGTATTACC	GCCTTTGAGT
4381	GAGCTGATAC	CGCTCGCCGC	AGCCGAACGA	CCGAGCGCAG	CGAGTCAGTG	AGCGAGGAAG
4441	CGGAAGAGCG	CCTGATGCGG	TATTTTCTCC	TTACGCATCT	GTGCGGTATT	TCACACCGCA
4501	TAATTTTGTT	AAAATTCGCG	TTAAATTTTT	GTTAAATCAG	CTCATTTTTT	AACCAATAGG
4561	CCGAAATCGG	CAAAATCCCT	TATAAATCAA	AAGAATAGAC	CGAGATAGGG	TTGAGTGTTG
4621	TTCCAGTTTG	GAACAAGAGT	CCACTATTAA	AGAACGTGGA	CTCCAACGTC	AAAGGGCGAA
4681	AAACCGTCTA	TCAGGGCGAT	GGCCCACTAC	GTGAACCATC	ACCCTAATCA	AGTTTTTTTG
4741	GGTCGAGGTG	CCGTAAAGCA	CTAAATCGGA	ACCCTAAAGG	GAGCCCCCGA	TTTAGAGCTT
4801	GACGGGGAAA	GCCGGCGAAC	GTGGCGAGAA	AGGAAGGGAA	GAAAGCGAAA	GGAGCGGGCG
4861	CTAGGGCGCT	GGCAAGTGTA	GCGGTCACGC	TGCGCGTAAC	CACCACACCC	GCCGCGCTTA
4921	ATGCGCCGCT	ACAGGGCGCG	TCCATTGCGC	ATTGAGGCTG	CTATGGTGCA	CTCTCAGTAC
4981	AATCTGCTCT	GATGCCGCAT	AGTTAAGCCA	GTACCAGTCA	CGTAGCGATA	TCGGAGTGTA
5041	TACACTCCGC	TATCGCTACG	TGACTGGGTC	ATGGCTGCGC	CCCGACACCC	GCCAACACCC
5101	GCTGACGCGC	CCTGACGGGC	TTGTCTGCTC	CCGGCATCCG	CTTACAGACA	AGCTGTGACC
5161	GTCTCCGGGA	GCTGCATGTG	TCAGAGGTTT	TCACCGTCAT	CACCGAAACG	CGCGAGGCAG
5221	CAGATCAATT	CGCGCGCGAA	GGCGAAGCGG	CATGCATTTA	CGTTGACACC	ATCGAATGGT
5281	GCAAAACCTT	TCGCGGTATG	GCATGATAGC	GCCCCGGAAGA	GAGTCAATTC	AGGGTGGTGA
5341	ATGTGAAACC	AGTAACGTTA	TACGATGTCG	CAGAGTATGC	CGGTGTCTCT	TATCAGACCG
5401	TTTCCCGCGT	GGTGAACCAG	GCCAGCCACG	TTTCTGCGAA	AACGCGGGAA	AAAGTGGAAG
5461	CGGCGATGGC	GGAGCTGAAT	TACATTCCCA	ACCGCGTGGC	ACAACAACCTG	GCGGGCAAAC
5521	AGTCGTTGCT	GATTGGCGTT	GCCACCTCCA	GTCTGGCCCT	GCACGCGCCG	TCGCAAATTG
5581	TCGCGGCGAT	TAAATCTCGC	GCCGATCAAC	TGGGTGCCAG	CGTGGTGGTG	TCGATGGTAG
5641	AACGAAGCGG	CGTCGAAGCC	TGTAAAGCGG	CGGTGCACAA	TCTTCTCGCG	CAACGCGTCA
5701	GTGGGCTGAT	CATTAACCTAT	CCGCTGGATG	ACCAGGATGC	CATTGCTGTG	GAAGCTGCCT
5761	GCACTAATGT	TCCGGCGTTA	TTTCTTGATG	TCTCTGACCA	GACACCCATC	AACAGTATTA
5821	TTTTCTCCCA	TGAAGACGGT	ACGCGACTGG	GCGTGGAGCA	TCTGGTCGCA	TTGGGTCAAC
5881	AGCAAATCGC	GCTGTTAGCG	GGCCCATTA	GTTCTGTCTC	GGCGCGTCTG	CGTCTGGCTG
5941	GCTGGCATAA	ATATCTCACT	CGCAATCAAA	TTCAGCCGAT	AGCGGAACGG	GAAGGCGACT
6001	GGAGTGCCAT	GTCCGGTTTT	CAACAAACCA	TGCAAATGCT	GAATGAGGGC	ATCGTTCCCA-

FIGURE 21C

6061 CTGCGATGCT GGTGCCAAC GATCAGATGG CGCTGGGCGC AATGCGCGCC ATTACCGAGT
6121 CCGGGCTGCG CGTTGGTGCG GATATCTCGG TAGTGGGATA CGACGATACC GAAGACAGCT
6181 CATGTTATAT CCCGCCGTTA ACCACCATCA AACAGGATTT TCGCCTGCTG GGGCAAACCA
6241 GCGTGGACCG CTTGCTGCAA CTCTCTCAGG GCCAGGCGGT GAAGGGCAAT CAGCTGTTGC
6301 CCGTCTCACT GGTGAAAAGA AAAACCACCC TGGCACCCAA TACGCAAACC GCCTCTCCCC
6361 GCGCGTTGGC CGATTCATTA ATGCAGCTGG CACGACAGGT TTCCCGACTG GAAAGCGGGC
6421 AGTGAGCGCA ACGCAATTAA TGTGAGTTAG CGCGAATTGA TCTG

6061 6121 6181 6241 6301 6361 6421

FIGURE 21D

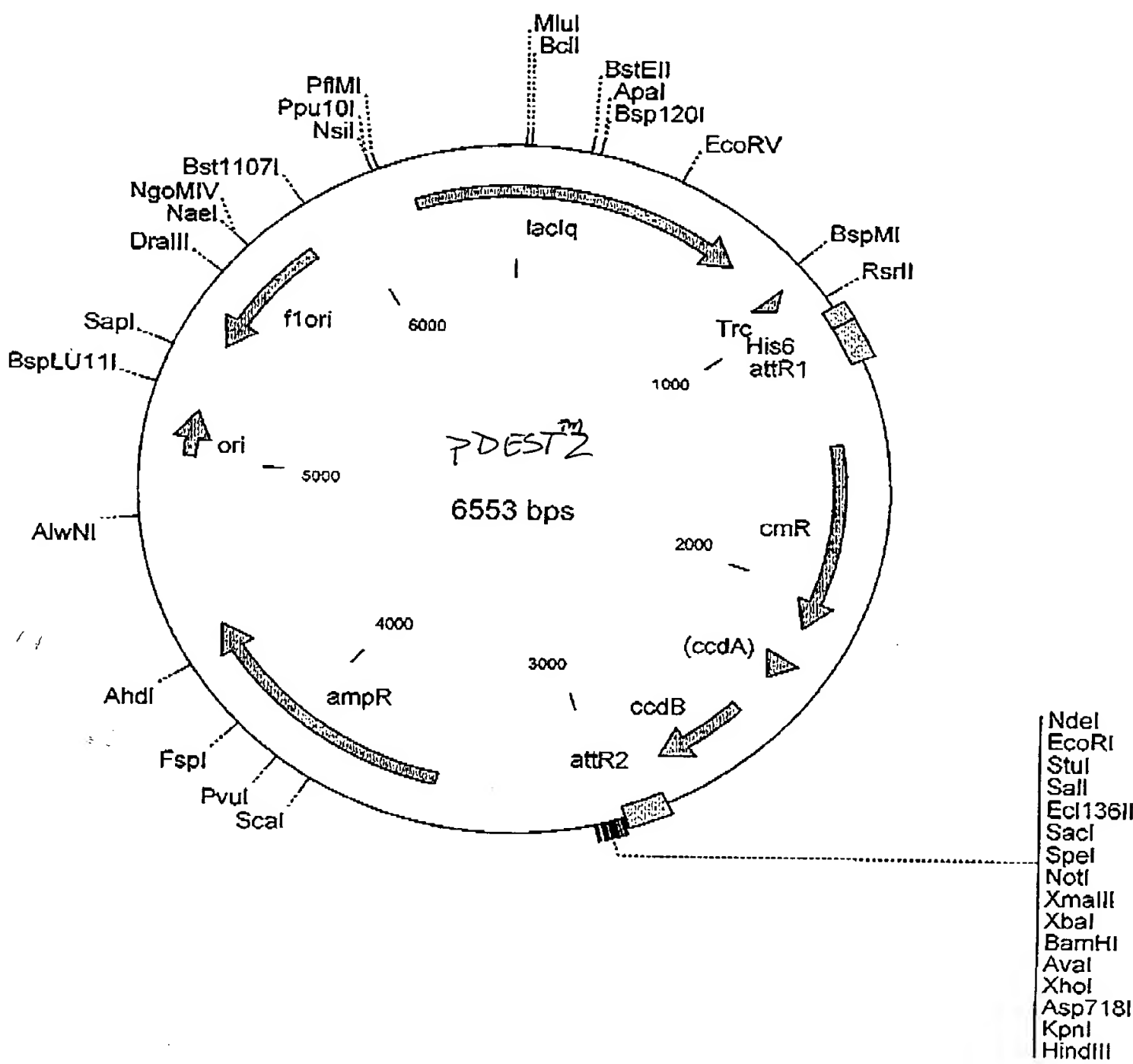
Figure 22A: pDEST2

His6 fusions in E. coli

970 aat att ctg aaa tga gct ggt gac aat ⁻³⁵ taa tca tcc ggt ccg tat aat ⁻¹⁰ ctg
 tta taa gac ttt act cga caa ctg tta att agt agg cca ggc ata tta gac

1021 tgg ^{RNA} aat tgt gag cgg ata aca att tca cac agg aaa cag acc ^{Met} atg ^{Ser} tcg ^{Tyr} tac
 acc tta aca ctc gcc tat tgt taa agt gtg tcc ttt gtc tgg tac agc atg

1072 ^{Tyr} ^{His} ^{His} ^{His} ^{His} ^{His} ^{His} ^{Glu} ^{Tle} ^{Trp} ^{Ser} ^{Trp} ^{attR1}
 tac cat cac cat cac cat cat ggt atc aca agt ttg tag aca aaa gct gaa
 atg gta gtg gta gtg gta gtg ccg tag tgt tca aac atg ttt ctt cga cgt



pDEST2 6553 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
912..962	Trc
1223..1009	attR1
1473..2132	CmR
2252..2336	inactivated ccdA
2474..2779	ccdB
2820..2944	attR2
3509..4414	ampR
5015..5175	ori
5415..5852	flori (f1 intergenic region)
6225..752	lacIq

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1  GCGGGTGCAC AATCTTCTCG CGCAACGCGT CAGTGGGCTG ATCATTAAC TATCCGCTGGA
61 TGACCAGGAT GCCATTGCTG TGGAAGCTGC CTGCACTAAT GTTCCGGCGT TATTTCTTGA
121 TGTCTCTGAC CAGACACCCA TCAACAGTAT TATTTTCTCC CATGAAGACG GTACGCGACT
181 GGGCGTGGAG CATCTGGTCG CATTGGGTCA CCAGCAAATC GCGCTGTTAG CGGGCCCATT
241 AAGTTCTGTC TCGGCGCGTC TCGCTCTGGC TGGCTGGCAT AAATATCTCA CTCGCAATCA
301 AATTCAGCCG ATAGCGGAAC GGGAAGGCGA CTGGAGTGCC ATGTCCGGTT TTCAACAAAC
361 CATGCAAATG CTGAATGAGG GCATCGTTCC CACTGCGATG CTGGTTGCCA ACGATCAGAT
421 GCGGCTGGGC GCAATGCGCG CCATTACCGA GTCCGGGCTG CGCGTTGGTG CGGATATCTC
481 GGTAGTGGGA TACGACGATA CCGAAGACAG CTCATGTTAT ATCCCGCCGT CAACCACCAT
541 CAAACAGGAT TTTCGCCTGC TGGGGCAAAC CAGCGTGGAC CGCTTGCTGC AACTCTCTCA
601 GGGCCAGGCG GTGAAGGGCA ATCAGCTGTT GCCCGTCTCA CTGGTGAAAA GAAAAACCAC
661 CCTGGCACCC AATACGAAA CCGCCTCTCC CCGCGCGTTG GCCGATTCAT TAATGCAGCT
721 GGCACGACAG GTTTCCCGAC TGGAAAGCGG GCAGTGAGCG CAACGCAATT AATGTGAGTT
781 AGCGCGAATT GATCTGGTTT GACAGCTTAT CATCGACTGC ACGGTGCACC AATGCTTCTG
841 GCGTCAGGCA GCCATCGGAA GCTGTGGTAT GGCTGTGCAG GTCGTAAATC ACTGCATAAT
901 TCGTGTGCTC CAAGGCGCAC TCCCGTTCTG GATAATGTTT TTTGCGCCGA CATCATAACG
961 GTTCTGGCAA ATATTCTGAA ATGAGCTGTT GACAATTAAT CATCCGGTCC GTATAATCTG
1021 TGGAATTGTG AGCGGATAAC AATTTACAC AGGAAACAGA CCATGTCGTA CTACCATCAC
1081 CATCACCATC ACGGCATCAC AAGTTTGTAC AAAAAAGCTG AACGAGAAAC GTAAAATGAT
1141 ATAAATATCA ATATATTAAT TTAGATTTTG CATAAAAAAC AGACTACATA ATACTGTAAA
1201 ACACAACATA TCCAGTCACT ATGGCGGCCG CTAAGTTGGC AGCATCACCC GACGCACTTT
1261 GCGCCGAATA AATACCTGTG ACGGAAGATC ACTTCGCAGA ATAAATAAAT CCTGGTGTCC
1321 CTGTTGATAC CGGGAAGCCC TGGGCCAACT TTTGGCGAAA ATGAGACGTT GATCGGCACG
1381 TAAGAGGTTT CAACTTTCAC CATAATGAAA TAAGATCACT ACCGGGCGTA TTTTGTGAGT
1441 TATCGAGATT TTCAGGAGCT AAGGAAGCTA AAATGGAGAA AAAAATCACT GGATATACCA
1501 CCGTTGATAT ATCCCAATGG CATCGTAAAG AACATTTTGA GGCATTTTCA TCAGTTGCTC
1561 AATGTACCTA TAACCAGACC GTTCAGCTGG ATATTACGGC CTTTTTAAAG ACCGTAAAGA
1621 AAAATAAGCA CAAGTTTAT CCAGCCTTTA TTCACATTCT TGCCCGCCTG ATGAATGCTC
1681 ATCCGGAATT CCGTATGGCA ATGAAAGACG GTGAGCTGGT GATATGGGAT AGTGTTTACC
1741 CTTGTTACAC CGTTTTCCAT GAGCAAAC TGACGCTCTG AGTGAATACC
1801 ACGACGATTT CCGGCAGTTT CTACACATAT ATTCGCAAGA TGTGGCGTGT TACGGTGAAA
1861 ACCTGGCCTA TTTCCCTAAA GGGTTTATTG AGAATATGTT TTTCGTCTCA GCCAATCCCT
1921 GGGTGAGTTT CACCAAGTTT GATTTAACG TGGCCAATAT GGACAACTTC TTCGCCCCCG
1981 TTTTCACCAT GGGCAAATAT TATACGCAAG GCGACAAGGT GCTGATGCCG CTGGCGATTC
2041 AGGTTTCATCA TGCCGTCTGT GATGGCTTCC ATGTCGGCAG AATGCTTAAT GAATTACAAC
2101 AGTACTGCGA TGAGTGGCAG GCGGGGCGT AAACGCGTGG ATCCGGCTTA CTAAAAGCCA
2161 GATAACAGTA TCGGTATTTG CGCGCTGATT TTTGCGGTAT AAGAATATAT ACTGATATGT
2221 ATACCCGAAG TATGTCAAAA AGAGGTGTGC TATGAAGCAG CGTATTACAG TGACAGTTGA
2281 CAGCGACAGC TATCAGTTGC TCAAGGCATA TATGATGTCA ATATCTCCGG TCTGGTAAGC
2341 ACAACCATGC AGAATGAAGC CCGTCGTCTG CGTGCCGAAC GCTGGAAAGC GGAAAATCAG
2401 GAAGGGATGG CTGAGGTCGC CCGGTTTATT GAAATGAACG GCTCTTTTGC TGACGAGAAC
2461 AGGGACTGGT GAAATGCAGT TTAAGGTTTA CACCTATAAA AGAGAGAGCC GTTATCGTCT
2521 GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCGGG CGACGGATGG TGATCCCCCT-

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FIGURE 22B

2581 GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA CTTTACCCGG TGGTGCATAT
2641 CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC AGTGTGCCGG TCTCCGTTAT
2701 CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC ATCAAAAACG CCATTAACCT
2761 GATGTTCTGG GGAATATAAA TGTCAAGGCTC CCTTATACAC AGCCAGTCTG CAGGTCGACC
2821 ATAGTGAAGT GATATGTTGT GTTTTACAGT ATTATGTAGT CTGTTTTTTA TGCAAAATCT
2881 AATTTAATAT ATTGATATTT ATATCATTTT ACGTTTCTCG TTCAGCTTTC TTGTACAAAG
2941 TGGTGATGCC CATATGGGAA TTCAAAGGCC TACGTCGACG AGCTCACTAG TCGCGGCCGC
3001 TTCTAGAGGA TCCCTCGAGG CATGCGGTAC CAAGCTTGGC TGTTTTGGCG GATGAGAGAA
3061 GATTTTCAGC CTGATACAGA TTAAATCAGA ACGCAGAAGC GGTCTGATAA AACAGAATTT
3121 GCCTGGCGGC AGTAGCGCGG TGGTCCCACC TGACCCCATG CCGAACTCAG AAGTGAAACG
3181 CCGTAGCGCC GATGGTAGTG TGGGGTCTCC CCATGCGAGA GTAGGGAACG GCCAGGCATC
3241 AAATAAAACG AAAGGCTCAG TCGAAAGACT GGGCCTTTTCG TTTTATCTGT TGTGTGTCGG
3301 TGAACGCTCT CCTGAGTAGG ACAAATCCGC CGGGAGCGGA TTTGAACGTT GCGAAGCAAC
3361 GGCCCGGAGG GTGGCGGGCA GGACGCCCGC CATAAACTGC CAGGCATCAA ATTAAGCAGA
3421 AGGCCATCCT GACGGATGGC CTTTTTGCGT TTCTACAAAC TCTTTTTGTT TATTTTTCTA
3481 AATACATTCA AATATGTATC CGCTCATGAG ACAATAACCC TGATAAATGC TTCAATAATA
3541 TTGAAAAGG AAGAGTATGA GTATTCAACA TTTCCGTGTC GCCCTTATTC CCTTTTTTGC
3601 GGCATTTTGC CTTCTGTGTT TTGCTCACCC AGAAACGCTG GTGAAAGTAA AAGATGCTGA
3661 AGATCAGTTG GGTGCACGAG TGGGTACAT CGAACTGGAT CTCAACAGCG GTAAGATCCT
3721 TGAGAGTTTT CGCCCCGAAG AACGTTTTCC AATGATGAGC ACTTTTAAAG TTCTGCTATG
3781 TGGCGCGGTA TTATCCCGTG TTGACGCCGG GCAAGAGCAA CTCGGTCGCC GCATACACTA
3841 TTCTCAGAAT GACTTGGTTG AGTACTCACC AGTCACAGAA AAGCATCTTA CGGATGGCAT
3901 GACAGTAAGA GAATTATGCA GTGCTGCCAT AACCATGAGT GATAACACTG CGGCCAACTT
3961 ACTTCTGACA ACGATCGGAG GACCGAAGGA GCTAACCGCT TTTTTGCACA ACATGGGGGA
4021 TCATGTAACG CGCCTTGATC GTTGGGAACC GGAGCTGAAT GAAGCCATAC CAAACGACGA
4081 GCGTGACACC ACGATGCCTA CAGCAATGGC AACAACTGTT CGCAAACTAT TAACTGGCGA
4141 ACTACTTACT CTAGCTTCCC GGCAACAATT AATAGACTGG ATGGAGGCGG ATAAAGTTGC
4201 AGGACCACTT CTGCGCTCGG CCCTTCCGGC TGGCTGGTTT ATTGCTGATA AATCTGGAGC
4261 CGGTGAGCGT GGGTCTCGCG GTATCATTGC AGCACTGGGG CCAGATGGTA AGCCCTCCCC
4321 TATCGTAGTT ATCTACACGA CGGGGAGTCA GGCAACTATG GATGAACGAA ATAGACAGAT
4381 CGCTGAGATA GGTGCCTCAC TGATTAAGCA TTGGTAACTG TCAGACCAAG TTTACTCATA
4441 TATACTTTAG ATTGATTTAA AACTTCATTT TTAATTTAAA AGGATCTAGG TGAAGATCCT
4501 TTTTGATAAT CTCATGACCA AAATCCCTTA ACGTGAGTTT TCGTTCCACT GAGCGTCAGA
4561 CCCCCTAGAA AAGATCAAAG GATCTTCTTG AGATCCTTTT TTTCTGCGCG TAATCTGCTG
4621 CTTGCAAACA AAAAAACCAC CGCTACCAGC GGTGGTTTGT TTGCCGGATC AAGAGCTACC
4681 AACTCTTTTT CCGAAGGTAA CTGGCTTCAG CAGAGCGCAG ATACCAAATA CTGTCTTCT
4741 AGTGTAGCCG TAGTTAGGCC ACCACTTCAA GAACCTCTGTA GCACCGCCTA CATACCTCGC
4801 TCTGCTAATC CTGTTACCAG TGGCTGCTGC CAGTGGCGAT AAGTCGTGTC TTACCGGGTT
4861 GGAATCAAGA CGATAGTTAC CGGATAAGGC GCAGCGGTCG GGCTGAACGG GGGGTTCTGT
4921 CACACAGCCC AGCTTGGAGC GAACGACCTA CACCGAAGT AGATACCTAC AGCGTGAGCT
4981 ATGAGAAAGC GCCACGCTTC CCGAAGGGAG AAAGGCGGAC AGGTATCCGG TAAGCGGCAG
5041 GGTGGAACA GGAGAGCGCA CGAGGGAGCT TCCAGGGGGA AACGCCTGGT ATCTTTATAG
5101 TCCTGTCGGG TTTGCGCCACC TCTGACTTGA GCGTGCATTT TTGTGATGCT CGTCAGGGGG
5161 GCGGAGCCTA TGGAAAACG CCAGCAACGC GGCCTTTTTA CGGTTCTCTG CCTTTTGCTG
5221 GCCTTTTGCT CACATGTTCT TTCCTGCGTT ATCCCCTGAT TCTGTGGATA ACCGTATTAC
5281 CGCCTTTGAG TGAGCTGATA CCGCTCGCCG CAGCCGAACG ACCGAGCGCA GCGAGTCAGT
5341 GAGCGAGGAA GCGGAAGAGC GCCTGATGCG GTATTTTCTC CTTACGCATC TGTGCGGTAT
5401 TTCACACCGC ATAATTTTGT TAAATTCGC GTTAAATTTT TGTTAAATCA GCTCATTTTT
5461 TAACCAATAG GCCGAAATCG GCAAAATCCC TTATAAATCA AAAGAATAGA CCGAGATAGG
5521 GTTGAGTGTT GTTCCAGTTT GGAACAAGAG TCCACTATTA AAGAACGTGG ACTCCAACGT
5581 CAAAGGGCGA AAAACCGTCT ATCAGGGCGA TGGCCCACTA CGTGAACCAT CACCCTAATC
5641 AAGTTTTTTG GGGTCGAGGT GCCGTAAAGC ACTAAATCGG AACCCTAAAG GGAGCCCCCG
5701 ATTTAGAGCT TGACGGGGAA AGCCGGCGAA CGTGGCGAGA AAGGAAGGGA AGAAAGCGAA
5761 AGGAGCGGGC GCTAGGGCGC TGGCAAGTGT AGCGGTCACG CTGCGCGTAA CCACCACACC
5821 CGCCGCGCTT AATGCGCCGC TACAGGGCGC GTCCCATTCG CCATTACAGC TGCTATGGTG
5881 CACTCTCAGT ACAATCTGCT CTGATGCCGC ATAGTTAAGC CAGTATACAC TCCGCTATCG
5941 CTACGTGACT GGGTCATGGC TGCGCCCCGA CACCCGCCAA CACCCGCTGA CGCGCCCTGA
6001 CGGGCTTGTC TGCTCCCGGC ATCCGCTTAC AGACAAGCTG TGACCGTCTC CGGGAGCTGC-

FIGURE 22C

6061	ATGTGTCAGA	GGTTTTTCACC	GTCATCACCG	AAACGCGCGA	GGCAGCAGAT	CAATTCGCGC
6121	GCGAAGGCGA	AGCGGCATGC	ATTTACGTTG	ACACCATCGA	ATGGTGCAAA	ACCTTTCGCG
6181	GTATGGCATG	ATAGCGCCCG	GAAGAGAGTC	AATTCAGGGT	GGTGAATGTG	AAACCAGTAA
6241	CGTTATACGA	TGTCGCAGAG	TATGCCGGTG	TCTCTTATCA	GACCGTTTCC	CGCGTGGTGA
6301	ACCAGGCCAG	CCACGTTTCT	GCGAAAACGC	GGGAAAAAGT	GGAAGCGGCG	ATGGCGGAGC
6361	TGAATTACAT	TCCCAACCGC	GTGGCACAAC	AACTGGCGGG	CAAACAGTCG	TTGCTGATTG
6421	GCGTTGCCAC	CTCCAGTCTG	GCCCTGCACG	CGCCGTCGCA	AATTGTCGCG	GCGATTAAAT
6481	CTCGCGCCGA	TCAACTGGGT	GCCAGCGTGG	TGGTGTCGAT	GGTAGAACGA	AGCGGCGTCG
6541	AAGCCTGTAA	AGC				

6061 6121 6181 6241 6301 6361 6421 6481 6541

FIGURE 22D

Figure 23A: PDEST3

GST fusions in E. coli

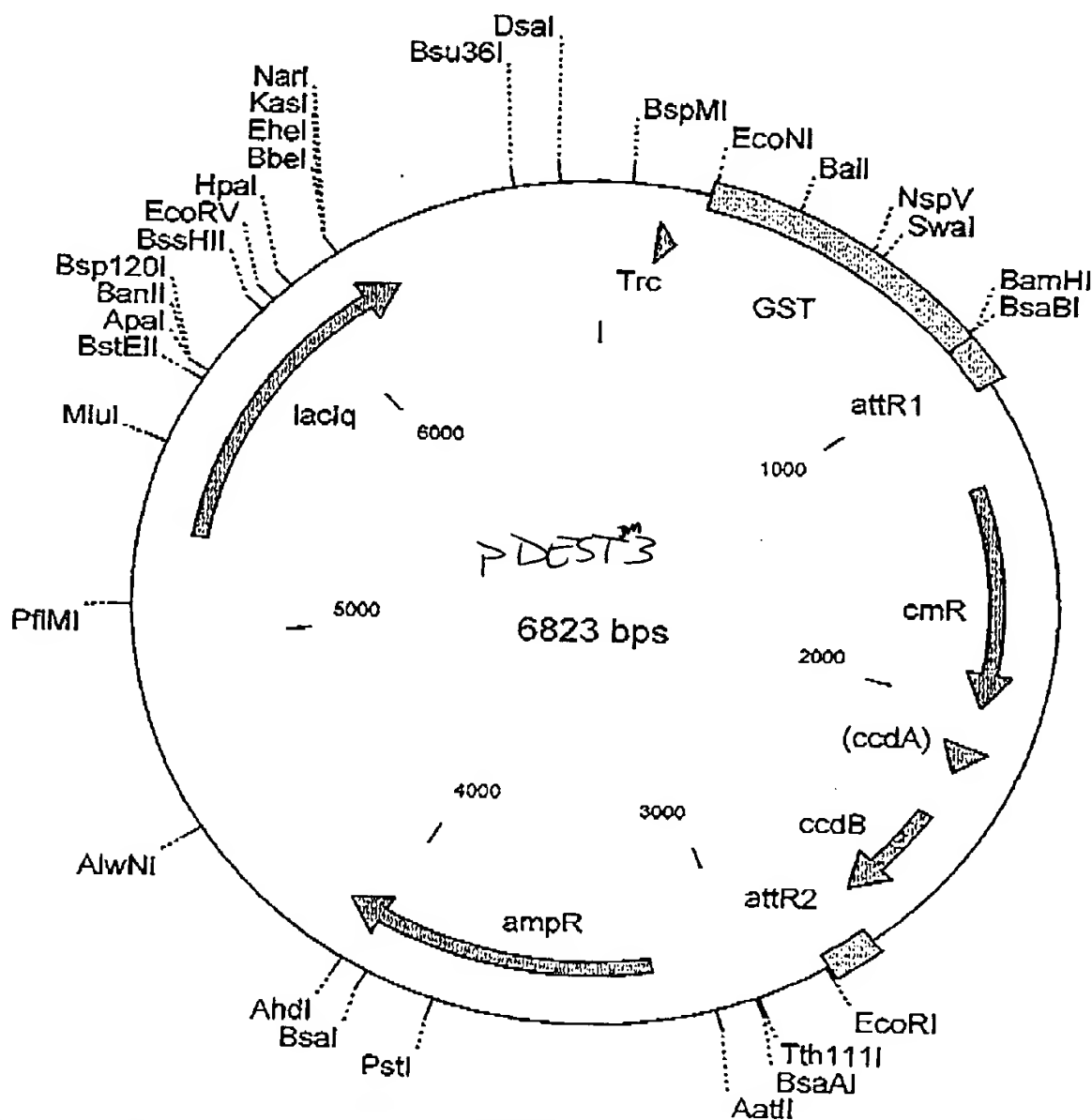
154 cgg ttc tgg caa ata ttc tga aat gag ctg ⁻³⁵ ttg aca att aat cat cgg ctc
gcc aag acc gtt tat aag act tta ctc gac aac tgt taa tta gta gcc gag

205 ⁻¹⁰ gta taa tgt gtg gaa ^{→ mRNA} ttg tga gcg gat aac aat ttc aca cag gaa aca gta
cat att aca cac ctt aac act cgc cta ttg tta aag tgt gtc ctt tgt cat

256 ^{M S P I L} ^{→ GST} ttc atg tcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg caa ccc
aag tac agg gga tat gat cca ata acc ttt taa ttc ccg gaa cac gtt ggg

919 ^{''' GST} ctg gtt ccg ^R cgt ^G gga ^S tct ^R cgt ^R cgt ^A gca ^S tct ^V gtt ^G gga ^S tcc ^P cca ^S tca aca agt
gac caa ggc gca cct aga gca gca cgt aga caa cct agg ggt agt tgt tca

970 ^{H Y K K} ~~tgg tac aac aac gct gaa cga gaa acg taa aat gat ata aat acc aat ata~~
~~aac atg ttt ttt cga cgt gct cct tgc att tta cta tat tta tag tta tat~~



pDEST3 6823 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
150..200	Trc
1087..963	attR1
1337..1996	CmR
2116..2200	inactivated ccdA
2338..2643	ccdB
2684..2808	attR2
3231..4091	ampR
5295..6254	lacIq

```

1  ACGTTATCGA CTGCACGGTG CACCAATGCT TCTGGCGTCA GGCAGCCATC GGAAGCTGTG
61 GTATGGCTGT GCAGGTCGTA AATCACTGCA TAATTCGTGT CGCTCAAGGC GCACTCCCGT
121 TCTGGATAAT GTTTTTTTGCG CCGACATCAT AACGGTTCTG GCAAATATTC TGAAATGAGC
181 TGTGACAAT TAATCATCGG CTCGTATAAT GTGTGGAATT GTGAGCGGAT AACAAATTCA
241 CACAGGAAAC AGTATTCATG TCCCCTATAC TAGGTTATTG GAAAATTAAG GGCCTTGTGC
301 AACCCACTCG ACTTCTTTTG GAATATCTTG AAGAAAAATA TGAAGAGCAT TTGTATGAGC
361 GCGATGAAGG TGATAAATGG CGAAACAAAA AGTTTGAATT GGGTTTGGAG TTTCCCAATC
421 TTCCTTATTA TATTGATGGT GATGTTAAAT TAACACAGTC TATGGCCATC ATACGTTATA
481 TAGCTGACAA GCACAACATG TTGGGTGGTT GTCCAAAAGA GCGTGCAGAG ATTTCAATGC
541 TTGAAGGAGC GGTTTTGGAT ATTAGATACG GTGTTTCGAG AATTGCATAT AGTAAAGACT
601 TTGAAACTCT CAAAGTTGAT TTTCTTAGCA AGCTACCTGA AATGCTGAAA ATGTTCTGAAG
661 ATCGTTTATG TCATAAAACA TATTTAAATG GTGATCATGT AACCCATCCT GACTTCATGT
721 TGTATGACGC TCTTGATGTT GTTTTATACA TGGACCCAAT GTGCCTGGAT GCGTTCCCAA
781 AATTAGTTTG TTTTAAAAAA CGTATTGAAG CTATCCCACA AATTGATAAG TACTTGAAAT
841 CCAGCAAGTA TATAGCATGG CCTTTGCAGG GCTGGCAAGC CACGTTTGGT GGTGGCGACC
901 ATCCTCCAAA ATCGGATCTG GTTCCGCGTG GATCTCGTCG TGCATCTGTT GGATCCCCAT
961 CAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT ATCAATATAT
1021 TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAAACACAA CATATCCAGT
1081 CACTATGGCG GCCGCTAAGT TGGCAGCATC ACCCGACGCA CTTTGCGCCG AATAAATACC
1141 TGTGACGGAA GATCACTTCG CAGAATAAAT AAATCCTGGT GTCCCTGTTG ATACCGGGAA
1201 GCCCTGGGCC AACTTTTGGC GAAAATGAGA CGTTGATCGG CACGTAAGAG GTTCCAACCT
1261 TCACCATAAT GAAATAAGAT CACTACCGGG CGTATTTTTT GAGTTATCGA GATTTTCAGG
1321 AGCTAAGGAA GCTAAAATGG AGAAAAAAAT CACTGGATAT ACCACCGTTG ATATATCCCA
1381 ATGGCATCGT AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA CCTATAACCA
1441 GACCGTTCAG CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA AGCACAAGTT
1501 TTATCCGGCC TTTATTCACA TTCTTGCCCC CCTGATGAAT GTCATCCGG AATTCCGTAT
1561 GGCAATGAAA GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT ACACCGTTTT
1621 CCATGAGCAA ACTGAAACGT TTTTCATCGCT CTGGAGTGAA TACCACGACG ATTTCCGGCA
1681 GTTTCTACAC ATATATTCGC AAGATGTGGC GTGTTACGGT GAAAACCTGG CCTATTTCCC
1741 TAAAGGGTTT ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA GTTTCACCAG
1801 TTTTGATTTA AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA CCATGGGCAA
1861 ATATTATACG CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGGTTT ATCATGCCGT
1921 CTGTGATGGC TTCCATGTCT GCAGAATGCT TAATGAATTA CAACAGTACT GCGATGAGTG
1981 GCAGGGCGGG GCGTAAAGAT CTGGATCCGG CTTACTAAAA GCCAGATAAC AGTATGCGTA
2041 TTTGCGCGCT GATTTTTGCG GTATAAGAAT ATATACTGAT ATGTATACCC GAAGTATGTC
2101 AAAAAGAGGT GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA CAGCTATCAG
2161 TTGCTCAAGG CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC ATGCAGAATG
2221 AAGCCCGTCG TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG
2281 TCGCCCGGTT TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC TGGTGAAATG
2341 CAGTTTAAGG TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT GGATGTACAG
2401 AGTGATATTA TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG TGCACGTCTG
2461 CTGTCAGATA AAGTCTCCCG TGAACCTTAC CCGGTGGTGC ATATCGGGGA TGAAAGCTGG
2521 CGCATGATGA CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA AGAAGTGGCT
2581 GATCTCAGCC ACCGCGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT CTGGGGAATA
2641 TAAATGTCAG GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTG ACTGGATATG-

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FIGURE 23B

Figure 24A: PDEST4

His6-thioredoxin fusions in E. coli

919 gca aat att ctg aaa tga gct gct gac aat taa tca tcc ggt ccg cat aat
cgt tta taa gac ttt act cga cca ctg tca att agt agg cca ggc ata tta

-35 Trc promoter -10

970 ctg tgg laa tgt gag cgg ata aca att tca cac agg aaa cag acc atg ggt
gac acc tta aca ctc gcc tat tgt taa agt gtg tcc ttt gtc tgg tac cca

His 6

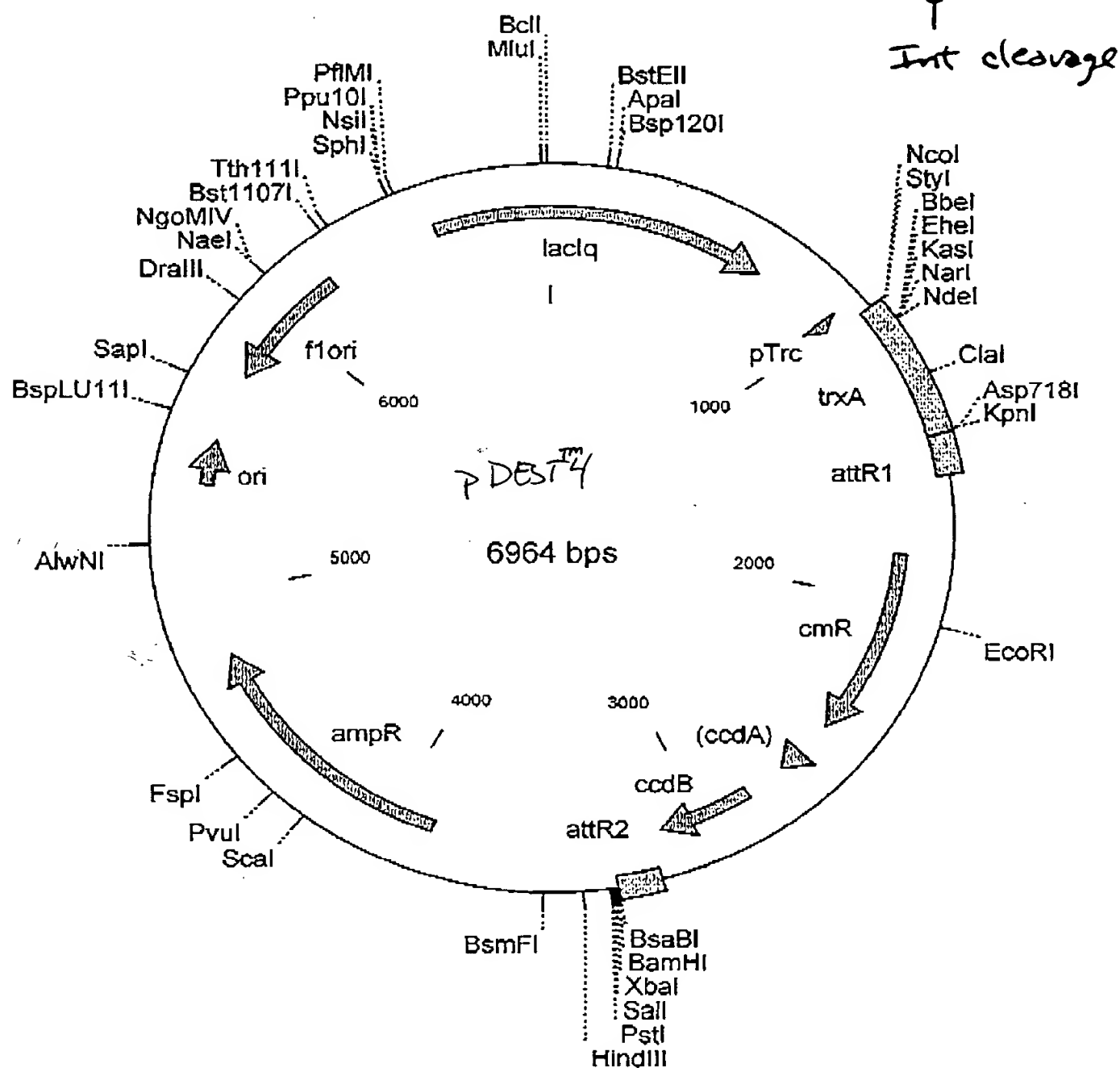
1021 His His His His His His Asp Tyr Asp Ile Pro Thr Thr Gly Asn Lys Tyr
cat cat cat cat cat cat gat tac gat atc cca acg acc gaa aac ctg tde
gta gta gta gta gta gtg cta atg cta tag ggt tgc tgg ctt ttg gac ata

TEV protease → Thioredoxin - (~150 amino acids)

1072 Phe Gln Gly Ala His Met Ser Asp Lys Ile Ile His Lys Thr Asn Asn Ser
ttt cag ggc gcc cat atg agc gat aaa att att cac ctg act gac gac agt
aaa gtc ccg cgg gta tac tcg cta ttt taa taa gtg gac tga ctg ctg tca

attR1

1429 Asp Asn Asp Asn Lys Val Pro Ile Thr Ser Lys Tyr Lys Lys
gat gat gat gat aag gta ccc atc tca agt ttg xde aaa aaa gcy gaa cga
cta ctg cta ctg ttc cat ggg tag tgt tca aac arg ttt ttt ttt ttt ttt



pDEST4 6964 bp

Location (Base Nos.)	Gene Encoded
964..1003	Trc
1577..1453	attR1
1827..2486	CmR
2606..2690	inactivated ccdA
2828..3133	ccdB
3174..3298	attR2
3872..4777	ampR
5378..5538	ori
5778..6215	flori (f1 intergenic region)
6587..704	lacIq

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1 CTATCCGCTG GATGACCAGG ATGCCATTGC TGTGGAAGCT GCCTGCACTA ATGTTCCGGC
61 GTTATTTCTT GATGTCTCTG ACCAGACACC CATCAACAGT ATTATTTTCT CCCATGAAGA
121 CGGTACGCGA CTGGGCGTGG AGCATCTGGT CGCATTGGGT CACCAGCAAA TCGCGCTGTT
181 AGCGGGCCCA TTAAGTTCTG TCTCGGCGCG TCTGCGTCTG GCTGGCTGGC ATAAATATCT
241 CACTCGCAAT CAAATTCAGC CGATAGCGGA ACGGGAAGGC GACTGGAGTG CCATGTCCGG
301 TTTTCAACAA ACCATGCAAA TGCTGAATGA GGGCATCGTT CCCACTGCGA TGCTGGTTGC
361 CAACGATCAG ATGGCGCTGG GCGCAATGCG CGCCATTACC GAGTCCGGGC TGCGCGTTGG
421 TGCGGATATC TCGGTAGTGG GATACGACGA TACCGAAGAC AGCTCATGTT ATATCCCGCC
481 GTCAACCACC ATCAAACAGG ATTTTCGCCT GCTGGGGCAA ACCAGCGTGG ACCGCTTGCT
541 GCAACTCTCT CAGGGCCAGG CGGTGAAGGG CAATCAGCTG TTGCCCCTCT CACTGGTGAA
601 AAGAAAAACC ACCCTGGCAC CCAATACGCA AACCGCCTCT CCCC GCGCGT TGGCCGATTC
661 ATTAATGCAG CTGGCACGAC AGGTTTCCCG ACTGGAAGC GGGCAGTGAG CGCAACGCAA
721 TTAATGTGAG TTAGCGCGAA TTGATCTGGT TTGACAGCTT ATCATCGACT GCACGGTGCA
781 CCAATGCTTC TGGCGTCAGG CAGCCATCGG AAGCTGTGGT ATGGCTGTGC AGGTCGTAAA
841 TCACTGCATA ATTCGTGTCT CTCAAGGCGC ACTCCCGTTC TGGATAATGT TTTTTCGCGC
901 GACATCATAA CGGTTCTGGC AAATATTCTG AAATGAGCTG TTGACAATTA ATCATCCGGT
961 CCGTATAATC TGTGGAATTG TGAGCGGATA ACAATTTTAC ACAGGAAACA GACCATGGGT
1021 CATCATCATC ATCATCACGA TTACGATATC CCAACGACCG AAAACCTGTA TTTTCAGGGC
1081 GCCCATATGA GCGATAAAAT TATTCACCTG ACTGACGACA GTTTTGACAC GGATGTACTC
1141 AAAGCGGACG GGGCGATCCT CGTCGATTTC TGGGCAGAGT GGTGCGGTCC GTGCAAAATG
1201 ATCGCCCCGA TTCTGGATGA AATCGCTGAC GAATATCAGG GCAAACCTGAC CGTTGCAAAA
1261 CTGAACATCG ATCAAAACCC TGGCACTGCG CCGAAATATG GCATCCGTGG TATCCCGACT
1321 CTGCTGCTGT TCAAAAACGG TGAAGTGGCG GCAACCAAAG TGGGTGCACT GTCTAAAGGT
1381 CAGTTGAAAG AGTTCCTCGA CGCTAACCTG GCCGGTTCTG GTTCTGGTGA TGACGATGAC
1441 AAGGTACCCA TCACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT
1501 ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAAACACAA
1561 CATATCCAGT CACTATGGCG GCCGCTAAGT TGGCAGCATC ACCCGACGCA CTTTTCGCGC
1621 AATAAATACC TGTGACGGAA GATCACTTCG CAGAATAAAT AAATCCTGGT GTCCCTGTTG
1681 ATACCGGGAA GCCCTGGGCC AACTTTTTGGC GAAAATGAGA CGTTGATCGG CACGTAAGAG
1741 GTTCCAACCT TCACCATAAT GAAATAAGAT CACTACCGGG CGTATTTTTT GAGTTATCGA
1801 GATTTTCAGG AGCTAAGGAA GCTAAAATGG AGAAAAAAT CACTGGATAT ACCACCGTTG
1861 ATATATCCCA ATGGCATCGT AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA
1921 CCTATAACCA GACCGTTCAG CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA
1981 AGCACAAGTT TTATCCGGCC TTTATTACAA TTCTTGCCCC CCTGATGAAT GCTCATCCGG
2041 AATTCCGTAT GGCAATGAAA GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT
2101 ACACCGTTTT CCATGAGCAA ACTGAAACGT TTTCATCGCT CTGGAGTGAA TACCACGACG
2161 ATTTCCGGCA GTTTCTACAC ATATATTCGC AAGATGTGGC GTGTTACGGT GAAAACCTGG
2221 CCTATTTCCC TAAAGGGTTT ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA
2281 GTTTCACCAG TTTTGATTTA AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA
2341 CCATGGGCAA ATATTATACG CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGGTTC
2401 ATCATGCCGT CTGTGATGGC TTCCATGTCT GCAGAAATGCT TAATGAATTA CAACAGTACT
2461 GCGATGAGTG GCAGGGCGGG GCGTAAACGC GTGGATCCGG CTTACTAAAA GCCAGATAAC
2521 AGTATGCGTA TTTGCGCGCT GATTTTTTGC GTATAAGAAT ATATACTGAT ATGTATACCC-

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FIGURE 24B

2581 GAAGTATGTC AAAAAGAGGT GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA
2641 CAGCTATCAG TTGCTCAAGG CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC
2701 ATGCAGAATG AAGCCCGTCG TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG
2761 ATGGCTGAGG TCGCCCGGTT TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC
2821 TGGTGAAATG CAGTTTAAGG TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT
2881 GGATGTACAG AGTGATATTA TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG
2941 TGCACGTCTG CTGTCAGATA AAGTCTCCCG TGAACTTTAC CCGGTGGTGC ATATCGGGGA
3001 TGAAAGCTGG CGCATGATGA CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA
3061 AGAAGTGGCT GATCTCAGCC ACCGCGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT
3121 CTGGGGAATA TAAATGTCAG GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTG
3181 ACTGGATATG TTGTGTTTTA CAGTATTATG TAGTCTGTTT TTTATGCAAA ATCTAATTTA
3241 ATATATTGAT ATTTATATCA TTTTACGTTT CTCGTTTCAGC TTTCTTGATC AAAGTGGTGA
3301 TGGGGATCCT CTAGAGTCGA CCTGCAGTAA TCGTACAGGG TAGTACAAAT AAAAAAGGCA
3361 CGTCAGATGA CGTGCCTTTT TTCTTGTTGAG CAGTAAGCTT GGCTGTTTTG GCGGATGAGA
3421 GAAGATTTTC AGCCTGATAC AGATTAAATC AGAACGCAGA AGCGGTCTGA TAAACAGAA
3481 TTTGCCTGGC GGCAGTAGCG CGGTGGTCCC ACCTGACCCC ATGCCGAAC CAGAAGTGAA
3541 ACGCCGTAGC GCCGATGGTA GTGTGGGGTC TCCCCATGCG AGAGTAGGGA ACTGCCAGGC
3601 ATCAAATAAA ACGAAAGGCT CAGTCGAAAG ACTGGGCCTT TCGTTTTATC TGTGTTTGT
3661 CGGTGAACGC TCTCCTGAGT AGGACAAATC CGCCGGGAGC GGATTTGAAC GTTGCGAAGC
3721 AACGGCCCGG AGGGTGGCGG GCAGGACGCC CGCCATAAAC TGCCAGGCAT CAAATTAAGC
3781 AGAAGGCCAT CCTGACGGAT GGCCTTTTTG CGTTTCTACA AACTCTTTTT GTTTATTTTT
3841 CTAAATACAT TCAAATATGT ATCCGCTCAT GAGACAATAA CCCTGATAAA TGCTTCAATA
3901 ATATTGAAAA AGGAAGAGTA TGAGTATTCA ACATTTCCGT GTCGCCCTTA TTCCCTTTTT
3961 TCGGGCATT TGCCTTCCTG TTTTGTCTCA CCCAGAAACG CTGGTGAAAG TAAAAGATGC
4021 TGAAGATCAG TTGGGTGCAC GAGTGGGTTA CATCGAACTG GATCTCAACA GCGGTAAGAT
4081 CCTTGAGAGT TTTCGCCCCG AAGAACGTTT TCCAATGATG AGCACTTTTA AAGTTCTGCT
4141 ATGTGGCGCG GTATTATCCC GTGTTGACGC CGGGCAAGAG CAACTCGGTC GCCGCATACA
4201 CTATTCTCAG AATGACTTGG TTGAGTACTC ACCAGTCACA GAAAAGCATC TTACGGATGG
4261 CATGACAGTA AGAGAATTAT GCAGTGCTGC CATAACCATG AGTGATAACA CTGCGGCCAA
4321 CTTACTTCTG ACAACGATCG GAGGACCGAA GGAGCTAACC GCTTTTTTGC ACAACATGGG
4381 GGATCATGTA ACTCGCCTTG ATCGTTGGGA ACCGGAGCTG AATGAAGCCA TACCAAACGA
4441 CGAGCGTGAC ACCACGATGC CTACAGCAAT GGCAACAACG TTGCGCAAAC TATTAAGTGG
4501 CGAACTACTT ACTCTAGCTT CCCGGCAACA ATTAATAGAC TGGATGGAGG CGGATAAAGT
4561 TGCAGGACCA CTTCTGCGCT CGGCCCTTCC GGCTGGCTGG TTTATTGCTG ATAAATCTGG
4621 AGCCGGTGAG CGTGGGTCTC GCGGTATCAT TGCAGCACTG GGGCCAGATG GTAAGCCCTC
4681 CCGTATCGTA GTTATCTACA CGACGGGGAG TCAGGCAACT ATGGATGAAC GAAATAGACA
4741 GATCGCTGAG ATAGGTGCCT CACTGATTAA GCATTGGTAA CTGTCAGACC AAGTTTACTC
4801 ATATATACTT TAGATTGATT TAAAACCTCA TTTTAAATTT AAAAGGATCT AGGTGAAGAT
4861 CCTTTTTGAT AATCTCATGA CCAAATCCC TTAACGTGAG TTTTCGTTCC ACTGAGCGTC
4921 AGACCCCGTA GAAAAGATCA AAGGATCTTC TTGAGATCCT TTTTTTCTGC GCGTAATCTG
4981 CTGCTTGCAA ACAAAAAAAC CACCGCTACC AGCGGTGGTT TGTTTGCCGG ATCAAGAGCT
5041 ACCAACTCTT TTTCCGAAGG TAACTGGCTT CAGCAGAGCG CAGATACCAA ATACTGTCCT
5101 TCTAGTGTAG CCGTAGTTAG GCCACCACTT CAAGAACTCT GTAGCACCGC CTACATACCT
5161 CGCTCTGCTA ATCCTGTTAC CAGTGGCTGC TGCCAGTGGC GATAAGTCGT GTCTTACCGG
5221 GTTGGACTCA AGACGATAGT TACCGGATAA GGCGCAGCGG TCGGGCTGAA CGGGGGGTTT
5281 GTGCACACAG CCCAGCTTGG AGCGAACGAC CTACACCGAA CTGAGATACC TACAGCGTGA
5341 GCTATGAGAA AGCGCCACGC TTCCCGAAGG GAGAAAGGCG GACAGGTATC CGGTAAGCGG
5401 CAGGGTCGGA ACAGGAGAGC GCACGAGGGA GCTTCCAGGG GGAAACGCCT GGTATCTTTA
5461 TAGTCCTGTC GGGTTTCGCC ACCTCTGACT TGAGCGTCTG TTTTGTGAT GCTCGTCAGG
5521 GGGGCGGAGC CTATGGAAAA ACGCCAGCAA CGCGGCCTTT TTACGGTTCC TGGCCTTTTG
5581 CTGGCCTTTT GCTCACATGT TCTTTCCTGC GTTATCCCCT GATTCTGTGG ATAACCGTAT
5641 TACCGCCTTT GAGTGAGCTG ATACCGCTCG CCGCAGCCGA ACGACCGAGC GCAGCGAGTC
5701 AGTGAGCGAG GAAGCGGAAG AGCGCCTGAT GCGGTATTTT CTCCTTACGC ATCTGTGCGG
5761 TATTTACACAC CGCATAATTT TGTAAATTT CGCGTTAAAT TTTTGTAA TACAGCTCAT
5821 TTTTAAACCAA TAGGCCGAAA TCGGCAAAAT CCCTTATAAA TCAAAAGAAT AGACCGAGAT
5881 AGGGTTGAGT GTTGTTCAG TTTGGAACAA GAGTCCACTA TTAAAGAACG TGGACTCCAA
5941 CGTCAAAGGG CGAAAAACCG TCTATCAGGG CGATGGCCCA CTACGTGAAC CATCACCCTA
6001 ATCAAGTTTT TTGGGGTCGA GGTGCCGTAA AGCACTAAAT CGGAACCCCTA AAGGGAGCCC-

FIGURE 24C

**pSPORT '+' (for sequencing, probes,
phagemid)**

1. agg cac ccc agg **-35** lac promoter -10 lac RUA
 tcc gtg ggg tcc gtt tac act tta tgc ttc cgg ctc gta tgt tgt gtg gaa
 gaa atg tga aat acg aag gcc gag cat aca aca cac ctt

"reverse" sequencing primers

52 ttg tga gcg gat aac aat ttc aca cag gaa aca gct ~~atg~~ acc atg att acg
aac act cgc cta ttg tta aag tgt gtc ctt tgt cga tac tgg tac taa tgc

103 cca agc tct aat acg act cac tat agg gaa agc tgg tac gcc tgc agg tac
ggt tcg aga tta tgc tga gtg ata tcc gtt tgc acc atg cgg acg tgc atg

154

	<u>EcoRI</u>		<u>SmaI</u>		<u>SmaI</u>				<u>Int</u>	<u>AttR1</u>								
	cgg	tcc	gga	att	ccc	ggg	tcc	acg	atc	aca	agt	tgg	xac	aaa	aaa	gct	gaa	
	gcc	agg	cct	taa	ggg	ccc	agc	tgc	tag	tgt	tca	aac	atg	ttt	ttt	cga	gtt	

Gene

1990

	Int												αTR2				Spe			
	ttr	acg	ttt	ctc	ott	cag	ctt	tct	tgt	aca	aag	tgg	tga	tca	cta	gtc	ggc			
	aaa	tgc	aaa	gag	caa	gtc	gaa	aga	aca	tgc	ttc	acc	act	agt	gat	cag	ccg			

2041

	^{Nob}		^{Xba}		^{Bam}		^{Hind3}			^{Mlu}		^{Sph}							
	<u>ggc cgc</u>		<u>tct aga</u>		<u>gga tcc</u>		<u>aag ctt</u>		acg	<u>tac gcg</u>		<u>tgc atg</u>		cga	cgt	cat	agc		
	ccg gcg		aga tgt		cct agg		ttc gaa		tgc	atg cgc		acg tac		gct	gca	gta	tgc		

2092

tct	tct	ata	gtg	tca	cct	aaa	ttc	aat	tca	ctg	gcc	gtc	ggt	tta	caa	cgt
aga	aga	tat	cac	agt	gga	ttt	aag	tta	agt	gac	cgg	cag	caa	aat	ggt	gca

SP6 promoter

SP6 RNA

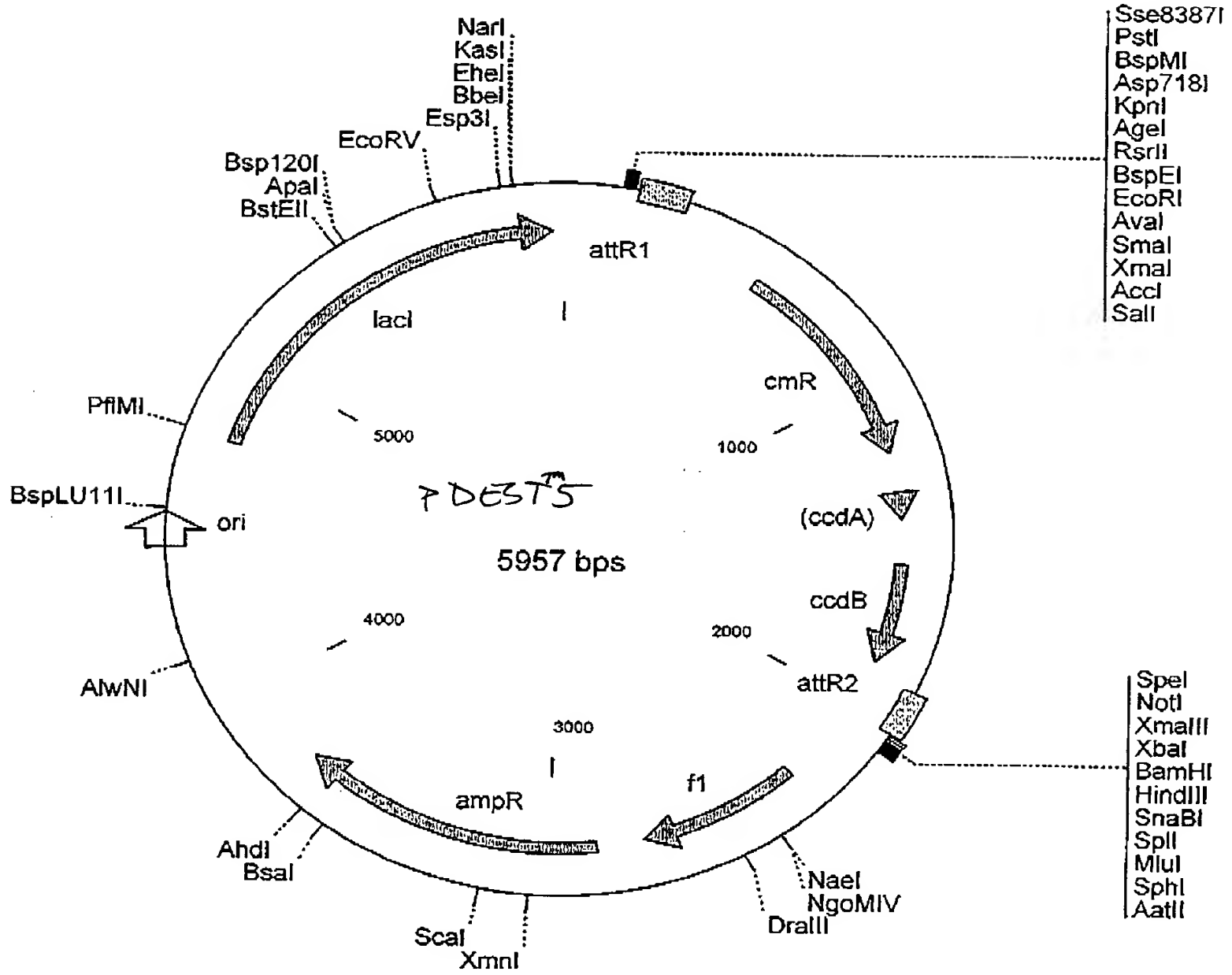
"forward sequencing"

2143 cgt gac tgg gaa aac cct ggc gtt acc caa ctt aat cgc ctt gca gca cat
gca ctg acc ctt ttg gga ccg gaa tgg gtt gaa tta gcg gaa cgt cgt gta
.. primers

Figure 25B

7 DEST5

(cont'd)



pDEST5 5957 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
305..181	attR1
555..1214	CmR
1334..1418	inactivated ccdA
1556..1861	ccdB
1902..2026	attR2
2278..2733	f1 (f1 intergenic region)
2865..3722	ampR
5378..5538	ori
4756..5922	lacI

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1 AGGCACCCCA GGCTTTACAC TTTATGCTTC CGGCTCGTAT GTTGTGTGGA ATTGTGAGCG
61 GATAACAATT TCACACAGGA AACAGCTATG ACCATGATTA CGCCAAGCTC TAATACGACT
121 CACTATAGGG AAAGCTGGTA CGCCTGCAGG TACCGGTCCG GAATTCCCGG GTCGACGATC
181 ACAAGTTTGT ACAAAAAAGC TGAACGAGAA ACGTAAATG ATATAAATAT CAATATATTA
241 AATTAGATTT TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA
301 CTATGGCGGC CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG
361 TGACGGAAGA TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC
421 CCTGGGCCAA CTTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAACTTTC
481 ACCATAATGA AATAAGATCA CTACCGGGCG TATTTTTTGA GTTATCGAGA TTTTCAGGAG
541 CTAAGGAAGC TAAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT
601 GGCATCGTAA AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA
661 CCGTTCAGCT GGATATTACG GCCTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT
721 ATCCGGCCTT TATTCACATT CTTGCCCCG TGATGAATGC TCATCCGGAA TTCCGTATGG
781 CAATGAAAGA CGGTGAGCTG GTGATATGGG ATAGTGTTC CACTTGTAC ACCGTTTTCC
841 ATGAGCAAAC TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT
901 TTCTACACAT ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA
961 AAGGGTTTAT TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGTT
1021 TTGATTTAAA CGTGGCCAAT ATGGACAAC TCTTCGCCCC CGTTTTTCACC ATGGGCAAAT
1081 ATTATACGCA AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTCAT CATGCCGTCT
1141 GTGATGGCTT CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC
1201 AGGGCGGGGC GTAAACGCGT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT
1261 TGCGCGCTGA TTTTTCGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA
1321 AAAGAGGTGT GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT
1381 GCTCAAGGCA TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA
1441 GCCCGTCGTC TGCGTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC
1501 GCCCGGTTTA TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA
1561 GTTTAAGGTT TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG
1621 TGATATTATT GACACGCCCC GGCGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT
1681 GTCAGATAAA GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG
1741 CATGATGACC ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA
1801 TCTCAGCCAC CGCGAAAATG ACATCAAAAA CGCCATTAAC CTGATGTTCT GGGGAATATA
1861 AATGTCAGGC TCCCTTATAC ACAGCCAGTC TGCAGGTCGA CCATAGTGAC TGGATATGTT
1921 GTGTTTTACA GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT ATATTGATAT
1981 TTATATCATT TTACGTTTCT CGTTCAGCTT TCTTGTAACA AGTGGTGATC ACTAGTCGGC
2041 GGCCGCTCTA GAGGATCCAA GCTTACGTAC GCGTGCATGC GACGTCATAG CTCTTCTATA
2101 GTGTCACCTA AATTCAATTC ACTGGCCGTC GTTTTACAAC GTCGTGACTG GGAAAACCCT
2161 GGCGTTACCC AACTTAATCG CCTTGCAGCA CATCCCCCTT TCGCCAGCTG GCGTAATAGC
2221 GAAGAGGCCC GCACCGATCG CCCTTCCCAA CAGTTGCGCA GCCTGAATGG CGAATGGACG
2281 CGCCCTGTAG CGGCGCATT AAGCGGCGG GTGTGGTGGT TACGCGCAGC GTGACCGCTA
2341 CACTTGCCAG CGCCCTAGCG CCCGCTCCTT TCGCTTTCTT CCCTTCCTTT CTCGCCACGT
2401 TCGCCGGCTT TCCCCGTCAA GCTCTAAATC GGGGGCTCCC TTTAGGGTTC CGATTTAGTG
2461 CTTTACGGCA CCTCGACCCC AAAAAACTTG ATTAGGGTGA TGGTTCACGT AGTGGGCCAT
2521 CGCCCTGATA GACGGTTTTT CGCCCTTTGA CGTTGGAGTC CACGTTCTTT AATAGTGGAC
2581 TCTTGTTCCA AACTGGAACA AACTCAACC CTATCTCGGT CTATTCTTTT GATTTATAAG-

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FIGURE 25C

2641 GGATTTTGGC GATTTTCGGCC TATTGGTTAA AAAATGAGCT GATTTAACAA AAATTTAACG
2701 CGAATTTTAA CAAAATATTA ACGTTTACAA TTTCAGGTGG CACTTTTCGG GGAAATGTGC
2761 GCGGAACCCC TATTTGTTTA TTTTCTATA TACATTCAAA TATGTATCCG CTCATGAGAC
2821 AATAACCCTG ATAAATGCTT CAATAATATT GAAAAAGGAA GAGTATGAGT ATTCAACATT
2881 TCCGTGTGCG CCTTATTCCC TTTTGTGCGG CATTTTGCCT TCCTGTTTTT GCTCACCAG
2941 AAACGCTGGT GAAAGTAAAA GATGCTGAAG ATCAGTTGGG TGCACGAGTG GGTTACATCG
3001 AACTGGATCT CAACAGCGGT AAGATCCTTG AGAGTTTTCG CCCCAGAGAA CGTTTTCCAA
3061 TGATGAGCAC TTTTAAAGTT CTGCTATGTG GCGCGGTATT ATCCCGTATT GACGCCGGGC
3121 AAGAGCAACT CGGTCGCCGC ATACACTATT CTCAGAATGA CTTGGTTGAG TACTCACCAG
3181 TCACAGAAAA GCATCTTACG GATGGCATGA CAGTAAGAGA ATTATGCAGT GCTGCCATAA
3241 CCATGAGTGA TAACACTGCG GCCAACTTAC TTCTGACAAC GATCGGAGGA CCGAAGGAGC
3301 TAACCGCTTT TTTGCACAAC ATGGGGGATC ATGTAACCTG CCTTGATCGT TGGGAACCGG
3361 AGCTGAATGA AGCCATACCA AACGACGAGC GTGACACCAC GATGCCTGTA GCAATGGCAA
3421 CAACGTTGCG CAAACTATTA ACTGGCGAAC TACTTACTCT AGCTTCCCGG CAACAATTAA
3481 TAGACTGGAT GGAGGCGGAT AAAGTTGCAG GACCACTTCT GCGCTCGGCC CTTCCGGCTG
3541 GCTGGTTTAT TGCTGATAAA TCTGGAGCCG GTGAGCGTGG GTCTCGCGGT ATCATTGCAG
3601 CACTGGGGCC AGATGGTAAG CCTCCCGTA TCGTAGTTAT CTACACGACG GGGAGTCAGG
3661 CAACTATGGA TGAACGAAAT AGACAGATCG CTGAGATAGG TGCCTCACTG ATTAAGCATT
3721 GGTAAGTGTG AGACCAAGTT TACTCATATA TACTTTAGAT TGATTTAAAA CTTTATTTTT
3781 AATTTAAAG GATCTAGGTG AAGATCCTTT TTGATAATCT CATGACCAA ATCCCTTAAC
3841 GTGAGTTTTC GTTCCACTGA GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG
3901 ATCCTTTTTT TCTGCGCGTA ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG
3961 TGGTTTGTTC GCCGGATCAA GAGCTACCAA CTCTTTTTCG GAAGGTAAGT GGCTTCAGCA
4021 GAGCGCAGAT ACCAAATACT GTCCTTCTAG TGTAGCCGTA GTTAGGCCAC CACTTCAAGA
4081 ACTCTGTAGC ACCGCCTACA TACCTCGCTC TGCTAATCCT GTTACCAGTG GCTGCTGCCA
4141 GTGGCGATAA GTCGTGTCTT ACCGGGTTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC
4201 AGCGGTCGGG CTGAACGGGG GGTTCGTGCA CACAGCCCAG CTTGGAGCGA ACGACCTACA
4261 CCGAACTGAG ATACCTACAG CGTGAGCATT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA
4321 AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC
4381 CAGGGGAAAA CGCCTGGTAT CTTTATAGTC CTGTGCGGTT TCGCCACCTC TGACTTGAGC
4441 GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG
4501 CCTTTTTTACG GTTCCTGGCC TTTTGCTGGC CTTTGTCTCA CATGTTCTTT CCTGCGTTAT
4561 CCCCTGATTC TGTGGATAAC CGTATTACCG CCTTTGAGTG AGCTGATACC GCTCGCCGCA
4621 GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGAGCGC CCAATACGCA
4681 AACCGCCTCT CCCCAGCGCT TGGCCGATTC ATTAATGCAG AGCTTGCAAT TCGCGCGCGA
4741 AGGCGAAGCG GCATTTACGT TGACACCATC GAATGGCGCA AAACCTTTCG CGGTATGGCA
4801 TGATAGCGCC CGGAAGAGAG TCAATTCAGG GTGGTGAATG TGAAACCAGT AACGTTATAC
4861 GATGTCGCAG AGTATGCCGG TGTCTCTTAT CAGACCGTTT CCCGCGTGGT GAACCAGGCC
4921 AGCCACGTTT CTGCGAAAAA GCGGGAAAAA GTGGAAGCGG CGATGGCGGA GCTGAATTAC
4981 ATTCCCAACC GCGTGGCACA ACAACTGGCG GGCAAACAGT CGTTGCTGAT TGGCGTTGCC
5041 ACCTCCAGTC TGGCCCTGCA CGCGCCGTCG CAAATTGTCG CGGCGATTAA ATCTCGCGCC
5101 GATCAACTGG GTGCCAGCGT GGTGGTGTGCG ATGGTAGAAC GAAGCGGCGT CGAAGCCTGT
5161 AAAGCGGCGG TGCACAATCT TCTCGCGCAA CCGGTCAGTG GGCTGATCAT TAACTATCCG
5221 CTGGATGACC AGGATGCCAT TGCTGTGGAA GCTGCCTGCA CTAATGTTCC GGCCTTATTT
5281 CTTGATGTCT CTGACCAGAC ACCCATCAAC AGTATTATTT TCTCCCATGA AGACGGTACG
5341 CGACTGGGCG TGGAGCATCT GGTGCGATTG GGTCACCAGC AAATCGCGCT GTTAGCGGGC
5401 CCATTAAGTT CTGTCTCGGC GCGTCTGCGT CTGGCTGGCT GGCATAAATA TCTCACTCGC
5461 AATCAAATTC AGCCGATAGC GGAACGGGAA GGCGACTGGA GTGCCATGTC CGGTTTTCAA
5521 CAAACCATGC AAATGCTGAA TGAGGGCATC GTTCCCACTG CGATGCTGGT TGCCAACGAT
5581 CAGATGGCGC TGGGCGCAAT GCGCGCCATT ACCGAGTCCG GGCTGCGCGT TGGTGC GGAT
5641 ATCTCGGTAG TGGGATACGA CGATACCGAA GACAGCTCAT GTTATATCCC GCCGTCAACC
5701 ACCATCAAAC AGGATTTTCG CCTGCTGGGG CAAACCAGCG TGGACCGCTT GCTGCAACTC
5761 TCTCAGGGCC AGGCGGTGAA GGGCAATCAG CTGTTGCCCG TCTCACTGGT GAAAAGAAAA
5821 ACCACCCTGG CGCCCAATAC GCAAACCGCC TCTCCCCGCG CGTTGGCCGA TTCATTAATG
5881 CAGCTGGCAC GACAGTTTTC CCGACTGGAA AGCGGGCAGT GAGCGCAACG CAATTAATGT
5941 GAGTTAGCTC ACTCATT

FIGURE 25D

Figure 2LeA

pDEST6

pSPORT "..."
(opposite strand)

"forward" sequencing primers

1 taa cgc cag ggt ttt ccc agt cac gac gtt gta aaa cga cgg cca gtg aat
att gcg gtc cca aaa ggg tca gtg ctg caa cat ttt gct gcc ggt cac tta

52 tga att tag gtg aca cta tag aag agc tat gac gtc gca tgc acg cgt acg
act taa atc cac tgt gat atc ttc tcg ata ctg cag ggt acg tgc gca tgc

SP6 promoter Sph Mlu

103 tat gct tgg atc ctc tag agc ggc cgc cga cta gtg atc aca agt tgg tgc
att cga acc tag gag atc tcg ccg ggc gct gat gac tag tgt tca aac atg

Hind3 Bam Xba Not Spe attR1 Int

154 aaa aaa gct gaa cga gaa acg taa aat gat ata aat atc aat ata tta aat
ttt ttt cga ctt gct ctt tgc att tta cta tat tta tag tta tat aat tta

Gene

1939 tat tta tat tat ttr acg ttt ctc gtt tag ctt gct tgt aca aag tgg tga
ata dat ata gta aaa tgc aaa gag eaa gtc gaa aga aca tgc ttc acc att

Int attR2

1990 tgc tgc acc cgg gaa ttc cgg acc ggt adc tgc agg cgt acc agc ttt ccc
agc agc tgg gcc ctt aag gcc tgg dca tgg acg tcc gca tgg tgc aaa ggg

Sal Sma EcoRI Kpn Pst

T7 RNA

2041 tat agt gag tgc tat tag agc ttg gcg taa tca tgg tca tag ctg ttt cct
ata tca ctc agc ata atc tcg aac cgc att agt acc agt atc gac aaa gga

T7 promoter α-peptide "reverse"

2092 gtg tga aat tgt tat ccg ctc aca att cca cac aac ata cga gct gga agc
cac act tta aca ata ggc gag tgt taa ggt gtg ttg tat gct cgg cct tgc

... sequencing primers lac RNA

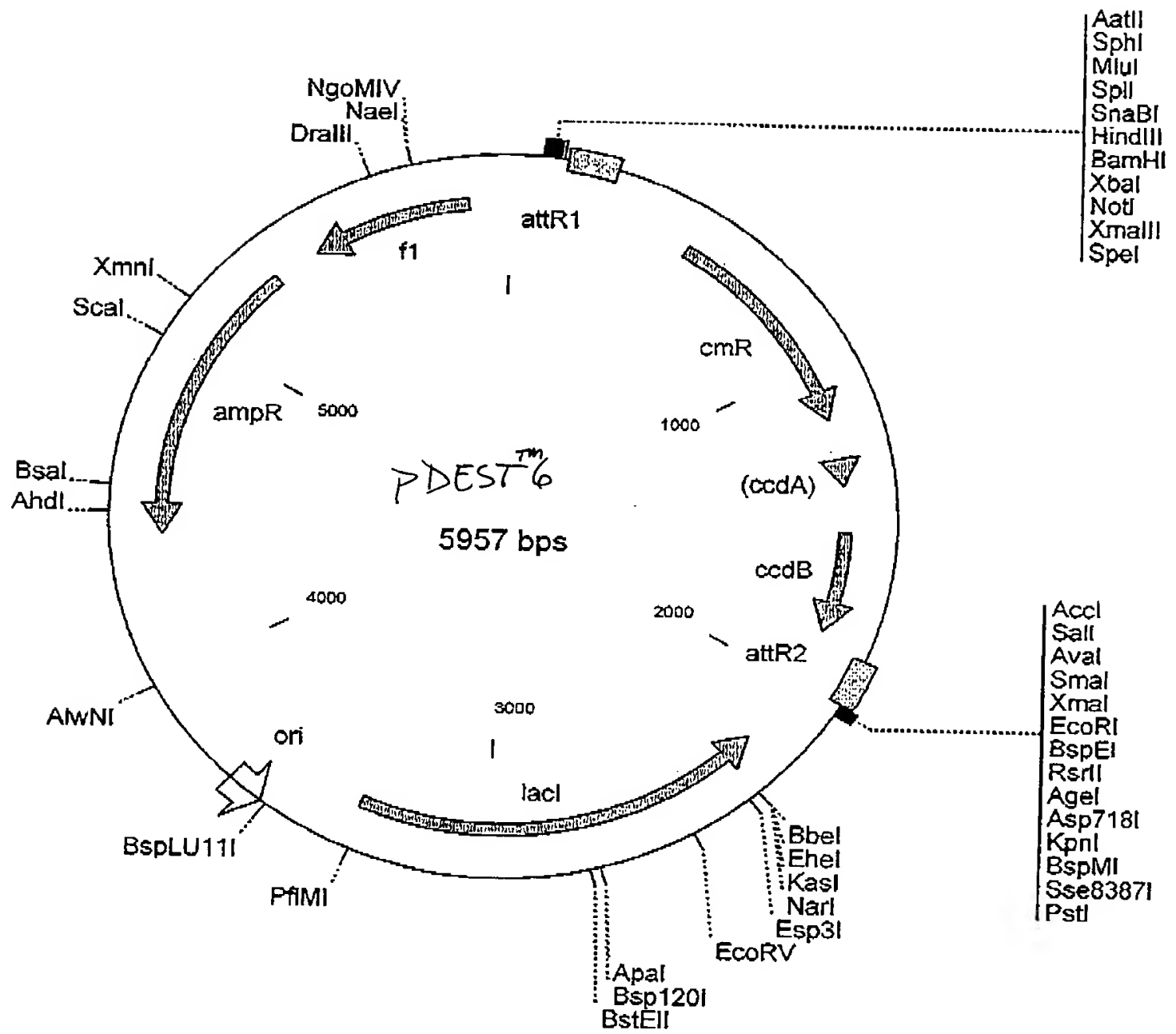
2143 ata aag tgt aaa gcc tgg ggt gcc taa tga gtg agc taa ctc aca tta att
tat ttc aca ttt cgg acc cca cgg att act cac tcg att gag tgt aat taa

-35

Figure 26B

PDEST6

(cont'd)



002000-00427660

pDEST6 5957 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
266..142	attR1
516..1175	CmR
1295..1379	inactivated ccdA
1517..1822	ccdB
1863..1987	attR2
2203..3369	lacI
4403..5260	ampR
5392..5847	f1 (f1 intergenic region)

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1 TAACGCCAGG GTTTTCCCAG TCACGACGTT GTAAAACGAC GGCCAGTGAA TTGAATTTAG
61 GTGACACTAT AGAAGAGCTA TGACGTGCGA TGCACGCGTA CGTAAGCTTG GATCCTCTAG
121 AGCGGCCGCC GACTAGTGAT CACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAAT
181 GATATAAATA TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT
241 AAAACACAAC ATATCCAGTC ACTATGGCGG CCGCTAAGTT GGCAGCATCA CCCGACGCAC
301 TTTGCGCCGA ATAAATACCT GTGACGGAAG ATCACTTCGC AGAATAAATA AATCCTGGTG
361 TCCCTGTTGA TACCGGGAAG CCCTGGGCCA ACTTTTGGCG AAAATGAGAC GTTGATCGGC
421 ACGTAAGAGG TTCCAAC TTT CACCATAATG AAATAAGATC ACTACCGGGC GTATTTTTTG
481 AGTTATCGAG ATTTTCAGGA GCTAAGGAAG CTAAAATGGA GAAAAAATC ACTGGATATA
541 CCACCGTTGA TATATCCCAA TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG
601 CTCAATGTAC CTATAACCAG ACCGTTTCAGC TGGATATTAC GGCCTTTTTTA AAGACCGTAA
661 AGAAAAATAA GCACAAGTTT TATCCGGCCT TTATTCACAT TCTTGCCCGC CTGATGAATG
721 CTCATCCGGA ATTCCGTATG GCAATGAAAG ACGGTGAGCT GGTGATATGG GATAGTGTTT
781 ACCCTTGTTA CACCGTTTTT CATGAGCAAA CTGAAACGTT TTCATCGCTC TGGAGTGAAT
841 ACCACGACGA TTTCCGGCAG TTTCTACACA TATATTCGCA AGATGTGGCG TGTTACGGTG
901 AAAACCTGGC CTATTTCCCT AAAGGGTTTA TTGAGAATAT GTTTTTCGTC TCAGCCAATC
961 CCTGGGTGAG TTTCACCAGT TTTGATTATA ACGTGGCCAA TATGGACAAC TTCTTCGCCC
1021 CCGTTTTTCAC CATGGGCAAA TATTATACGC AAGGCGACAA GGTGCTGATG CCGCTGGCGA
1081 TTCAGGTTCA TCATGCCGTC TGTGATGGCT TCCATGTCGG CAGAATGCTT AATGAATTAC
1141 AACAGTACTG CGATGAGTGG CAGGGCGGGG CGTAAACGCG TGGATCCGGC TTACTAAAAG
1201 CCAGATAACA GTATGCGTAT TTGCGCGCTG ATTTTTCGCG TATAAGAATA TATACTGATA
1261 TGTATACCCG AAGTATGTCA AAAAGAGGTG TGCTATGAAG CAGCGTATTA CAGTGACAGT
1321 TGACAGCGAC AGCTATCAGT TGCTCAAGGC ATATATGATG TCAATATCTC CGGTCTGGTA
1381 AGCACAACCA TGCAGAATGA AGCCCGTCGT CTGCGTGCCG AACGCTGGAA AGCGGAAAAT
1441 CAGGAAGGGA TGGCTGAGGT CGCCCGGTTT ATTGAAATGA ACGGCTCTTT TGCTGACGAG
1501 AACAGGGACT GGTGAAATGC AGTTTAAGGT TTACACCTAT AAAAGAGAGA GCCGTTATCG
1561 TCTGTTTGTG GATGTACAGA GTGATATTAT TGACACGCCG GGGCGACGGA TGGTGATCCC
1621 CCTGGCCAGT GCACGTCTGC TGTCAGATAA AGTCTCCCGT GAACTTTACC CGGTGGTGCA
1681 TATCGGGGAT GAAAGCTGGC GCATGATGAC CACCGATATG GCCAGTGTGC CGGTCTCCGT
1741 TATCGGGGAA GAAGTGGCTG ATCTCAGCCA CCGCGAAAAT GACATCAAAA ACGCCATTAA
1801 CCTGATGTTT TGGGGAATAT AAATGTCAGG CTCCCTTATA CACAGCCAGT CTGCAGGTG
1861 ACCATAGTGA CTGGATATGT TGTGTTTTAC AGTATTATGT AGTCTGTTTT TTATGCAAAA
1921 TCTAATTTAA TATATTGATA TTTATATCAT TTTACGTTTC TCGTTCAGCT TTCTTGTA
1981 AAGTGGTGAT CGTCGACCCG GGAATTCCGG ACCGGTACCT GCAGGCGTAC CAGCTTTCCC
2041 TATAGTGAGT CGTATTAGAG CTTGGCGTAA TCATGGTCAT AGCTGTTTCC TGTGTGAAAT
2101 TGTTATCCGC TCACAATTCC ACACAACATA CGAGCCGGAA GCATAAAGTG TAAAGCCTGG
2161 GGTGCCTAAT GAGTGAGCTA ACTCACATTA ATTGCGTTGC GCTCACTGCC CGCTTTCCAG
2221 TCGGGAAACC TGTCGTGCCA GCTGCATTAA TGAATCGGCC AACGCGCGGG GAGAGGCGGT
2281 TTGCGTATTG GGCGCCAGGG TGGTTTTTCT TTTACCAGT GAGACGGGCA ACAGCTGATT
2341 GCCCTTCACC GCCTGGCCCT GAGAGAGTTG CAGCAAGCGG TCCACGCTGG TTTGCCCCAG
2401 CAGGCGAAAA TCCTGTTTGA TGGTGTTTGA CGGCGGGATA TAACATGAGC TGTCTTCGGT
2461 ATCGTCGTAT CCCACTACCG AGATATCCGC ACCAACGCGC AGCCCGGACT CGGTAATGGC
2521 GCGCATTGCG CCCAGCGCCA TCTGATCGTT GGCAACCAGC ATCGCAGTGG GAACGATGCC
2581 CTCATTGAGC ATTTGCATGG TTTGTTGAAA ACCGGACATG GCACTCCAGT CGCCTTCCCG
2641 TTCCGCTATC GGCTGAATTT GATTGCGAGT GAGATATTTA TGCCAGCCAG CCAGACGCAG-

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FIGURE 26C

2701 ACGCGCCGAG ACAGAACTTA ATGGGCCCCG TAACAGCGCG ATTTGCTGGT GACCCAATGC
 2761 GACCAGATGC TCCACGCCCC GTGCGGTACC GTCTTCATGG GAGAAAATAA TACTGTTGAT
 2821 GGGTGTCTGG TCAGAGACAT CAAGAAATAA CGCCGGAACA TTAGTGCAGG CAGCTTCCAC
 2881 AGCAATGGCA TCCTGGTTCAT CCAGCGGATA GTTAATGATC AGCCCACTGA CCCGTTGCGC
 2941 GAGAAGATTG TGCACCGCCG CTTTACAGGC TTCGACGCCG CTTGCTTCTA CCATCGACAC
 3001 CACCACGCTG GCACCCAGTT GATCGGCGCG AGATTTAATC GCCGCGACAA TTTGCGACGG
 3061 CGCGTGCAGG GCCAGACTGG AGGTGGCAAC GCCAATCAGC AACGACTGTT TGCCCGCCAG
 3121 TTGTTGTGCC ACGCGGTTGG GAATGTAATT CAGCTCCGCC ATCGCCGCTT CCACTTTTTTC
 3181 CCGCGTTTTTC GCAGAAACGT GGCTGGCCTG GTTCACCACG CGGGAAACGG TCTGATAAGA
 3241 GACACCGGCA TACTCTGCGA CATCGTATAA CGTTACTGGT TTCACATTCA CCACCCTGAA
 3301 TTGACTCTCT TCCGGGCGCT ATCATGCCAT ACCGCGAAAG GTTTTGCGCC ATTCGATGGT
 3361 GTCAACGTAA ATGCCGCTTC GCCTTCGCGC GCGAATTGCA AGCTCTGCAT TAATGAATCG
 3421 GCCAACGCGC GGGGAGAGGC GGTTTGCGTA TTGGGCGCTC TTCCGCTTCC TCGCTCACTG
 3481 ACTCGCTGCG CTCGGTCGTT CGGCTGCGGC GAGCGGTATC AGCTCACTCA AAGGCGGTAA
 3541 TACGGTTATC CACAGAATCA GGGGATAACG CAGGAAAGAA CATGTGAGCA AAAGGCCAGC
 3601 AAAAGGCCAG GAACCGTAAA AAGGCCGCGT TGCTGGCGTT TTTCCATAGG CTCCGCCCCC
 3661 CTGACGAGCA TCACAAAAT CGACGCTCAA GTCAGAGGTG GCGAAACCCG ACAGGACTAT
 3721 AAAGATACCA GGCGTTTTCC CCTGGAAGCT CCCTCGTGCG CTCTCCTGTT CCGACCCTGC
 3781 CGCTTACCGG ATACCTGTCC GCCTTTCTCC CTTGCGGAAG CGTGGCGCTT TCTCAATGCT
 3841 CACGCTGTAG GTATCTCAGT TCGGTGTAGG TCGTTCGCTC CAAGCTGGGC TGTGTGCACG
 3901 AACCCCCCGT TCAGCCCGAC CGCTGCGCCT TATCCGGTAA CTATCGTCTT GAGTCCAACC
 3961 CGGTAAGACA CGACTTATCG CCACTGGCAG CAGCCACTGG TAACAGGATT AGCAGAGCGA
 4021 GGTATGTAGG CGGTGCTACA GAGTTCCTGA AGTGGTGGCC TAACTACGGC TACTAGAGAA
 4081 GGACAGTATT TGGTATCTGC GCTCTGCTGA AGCCAGTTAC CTTGCGAAAA AGAGTTGGTA
 4141 GCTCTTGATC CGGCAAACAA ACCACCGCTG GTAGCGGTGG TTTTTTTGTT TGCAAGCAGC
 4201 AGATTACGCG CAGAAAAAAA GGATCTCAAG AAGATCCTTT GATCTTTTCT ACGGGGTCTG
 4261 ACGCTCAGTG GAACGAAAAC TCACGTTAAG GGATTTTGGT CATGAGATTA TCAAAAAGGA
 4321 TCTTCACCTA GATCCTTTTA AATTAAAAAT GAAGTTTAA ATCAATCTAA AGTATATATG
 4381 AGTAAACTTG GTCTGACAGT TACCAATGCT TAATCAGTGA GGCACCTATC TCAGCGATCT
 4441 GTCTATTTTCG TTCATCCATA GTTGCCCTGAC TCCCGTCTCG GTAGATAACT ACGATACGGG
 4501 AGGGCTTACC ATCTGGCCCC AGTGCTGCAA TGATACCGCG AGACCCACGC TCACCGGCTC
 4561 CAGATTTATC AGCAATAAAC CAGCCAGCCG GAAGGGCCGA GCGCAGAAGT GGTCCTGCAA
 4621 CTTTATCCGC CTCCATCCAG TCTATTAATT GTTGCCGGGA AGCTAGAGTA AGTAGTTCGC
 4681 CAGTTAATAG TTTGCGCAAC GTTGTTGCCA TTGCTACAGG CATCGTGGTG TCACGCTCGT
 4741 CGTTTGGTAT GGCTTCATTC AGCTCCGGTT CCAACGATC AAGGCGAGTT ACATGATCCC
 4801 CCATGTTGTG CAAAAAAGCG GTTAGCTCCT TCGGTCCTCC GATCGTTGTC AGAAGTAAGT
 4861 TGGCCGCAGT GTTATCACTC ATGGTTATGG CAGCACTGCA TAATTCTCTT ACTGTCATGC
 4921 CATCCGTAAG ATGCTTTTCT GTGACTGGTG AGTACTCAAC CAAGTCATTC TGAGAATAGT
 4981 GTATGCGGCG ACCGAGTTGC TCTTGCCCCG CGTCAATACG GGATAATACC GCGCCACATA
 5041 GCAGAACTTT AAAAGTGCTC ATCATTGGAA AACGTTCTTC GGGGCGAAAA CTCTCAAGGA
 5101 TCTTACCGCT GTTGAGATCC AGTTCGATGT AACCCTCTCG TGCACCCAAC TGATCTTCAG
 5161 CATCTTTTAC TTTCACCAGC GTTTCTGGGT GAGCAAAAAC AGGAAGGCAA AATGCCGCAA
 5221 AAAAGGGAAT AAGGGCGACA CGGAAATGTT GAATACTCAT ACTCTTCCTT TTTCAATATT
 5281 ATTGAAGCAT TTATCAGGGT TATTGTCTCA TGAGCGGATA CATATTTGAA TGTATTTAGA
 5341 AAAATAAACA AATAGGGGTT CCGCGCACAT TTCCCCGAAA AGTGCCACCT GAAATTGTAA
 5401 ACGTTAATAT TTTGTTAAAA TTCGCGTTAA ATTTTGTGTA AATCAGCTCA TTTTAAACC
 5461 AATAGGCCGA AATCGGCAAA ATCCCTTATA AATCAAAAGA ATAGACCGAG ATAGGGTTGA
 5521 GTGTTGTTCC AGTTTGGAAC AAGAGTCCAC TATTAAAGAA CGTGGACTCC AACGTCAAAG
 5581 GCGGAAAAAC CGTCTATCAG GGCGATGGCC CACTACGTGA ACCATCACCC TAATCAAGTT
 5641 TTTTGGGGTC GAGGTGCCGT AAAGCACTAA ATCGGAACCC TAAAGGGAGC CCCCATTATA
 5701 GAGCTTGACG GGGAAAGCCG GCGAACGTGG CGAGAAAGGA AGGGAAGAAA GCGAAAGGAG
 5761 CGGGCGCTAG GGCGCTGGCA AGTGTAGCGG TCACGCTGCG CGTAACCACC ACACCCGCCG
 5821 CGCTTAATGC GCCGCTACAG GGCGCGTCCA TTCGCCATTC AGGCTGCGCA ACTGTTGGGA
 5881 AGGGCGATCG GTGCGGGCCT CTTGCTATT ACGCCAGCTG GCGAAAGGGG GATGTGCTGC
 5941 AAGGCGATTA AGTTGGG

FIGURE 26D

[illegible]

CMV promoter for eukaryotic expression

970 cca ttg acg caa atg ggc ggt agg cgt gta cgg tgg gag gtc tat ata agc
ggt aac tgc gtt tac ccg cca tcc gca cat gcc acc ctc cag ata tat tgc

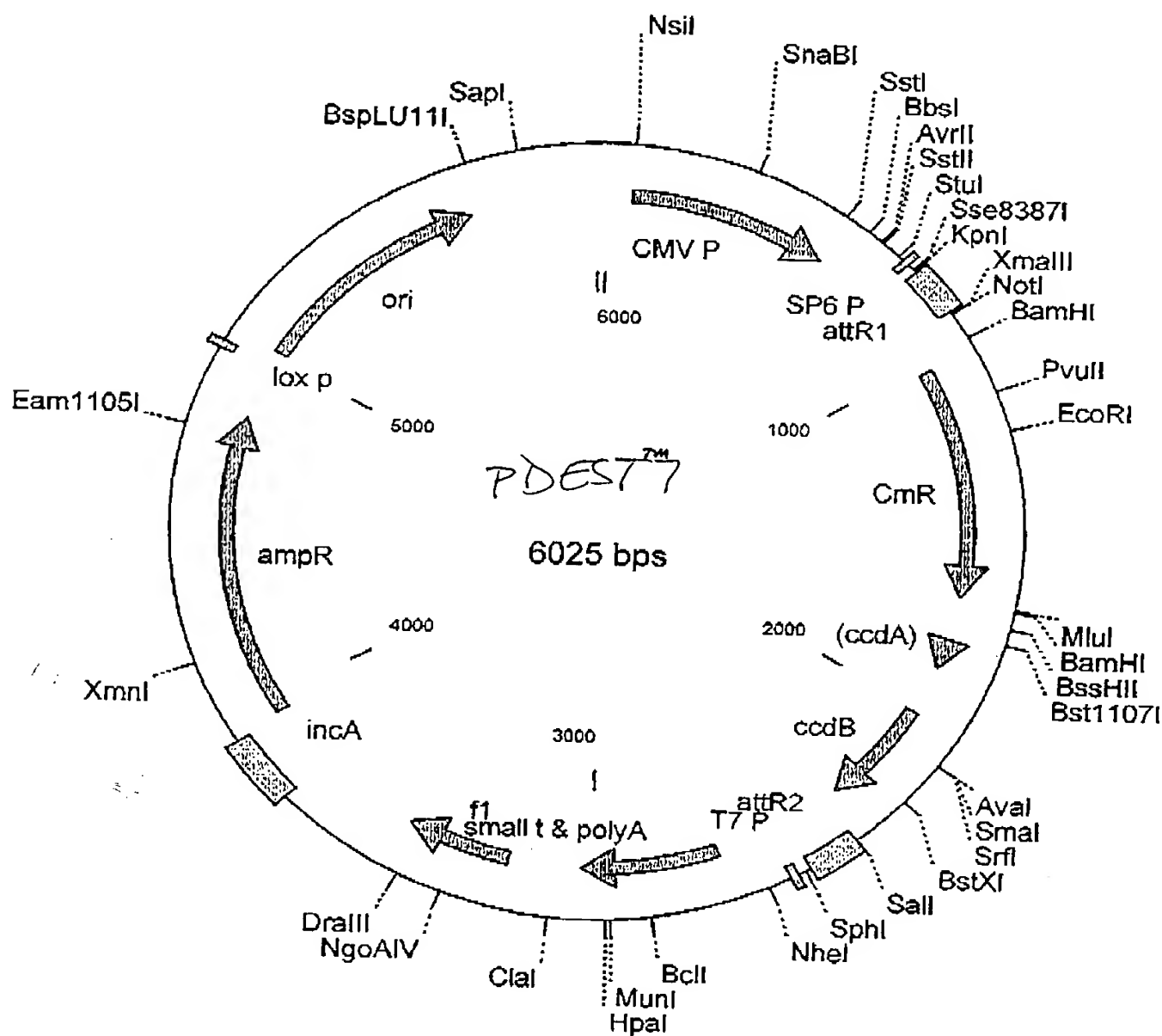
1021 aga gct cgt tta gtg aac cgt cag atc gcc tgg aga cgc cat cca cgc tgt
tct cga gca aat cac ttg gca gtc tag cgg acc tct gcg gta ggt gcg aca

1072 ttt gac ctc cat aga aga cac cgg gac cga tcc agc ctc cgg act cta gcc
aaa ctg gag gta tct tct gtg gcc ctg gct agg tgc gag gcc tga gat cgg

1123 tag gcc gcg gag cgg ata aca att tca cac agg aaa cag cta tga cca cta
atc cgg cgc ctc gcc tat tgt taa agt gtg tcc ttt gtc gat act ggt gat

1174 ggc ttt tgc aaa aag cta ttt agg tga cac tat aga agg tac gcc tgc agg
ccg aaa acg ttt ttc gat aaa tcc act gtg ata tct tcc atg cgg acg tct

1225 tac cgg tcc gga att ccc atc aca agt ttg tag aca aaa ggt gaa cga gaa
atg gcc agg cct taa ggg tag tgt tca aac atg ttt tyt cga ctc gct ctc



pDEST7 6025 bp (rotated to position 2800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..589	CMV promoter
906..782	attR1
1015..1674	CmR
1794..1878	inactivated ccdA
2016..2321	ccdB
2362..2486	attR2
2671..3033	small t & polyA
3227..3502	f1
3962..4822	ampR
5022..5661	ori

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1  ATTATCATGA  CATTAACCTA  TAAAAATAGG  CGTAGTACGA  GGCCCTTTCA  CTCATTAGAT
61  GCATGTCGTT  ACATAACTTA  CGGTAAATGG  CCCGCCTGGC  TGACCGCCCA  ACGACCCCCG
121  CCCATTGACG  TCAATAATGA  CGTATGTTCC  CATAGTAACG  CCAATAGGGA  CTTTCCATTG
181  ACGTCAATGG  GTGGAGTATT  TACGGTAAAC  TGCCCACTTG  GCAGTACATC  AAGTGTATCA
241  TATGCCAAGT  ACGCCCCCTA  TTGACGTCAA  TGACGGTAAA  TGGCCCGCCT  GGCATTATGC
301  CCAGTACATG  ACCTTATGGG  ACTTTCCTAC  TTGGCAGTAC  ATCTACGTAT  TAGTCATCGC
361  TATTACCATG  GTGATGCGGT  TTTGGCAGTA  CATCAATGGG  CGTGGATAGC  GGTTTGACTC
421  ACGGGGATTT  CCAAGTCTCC  ACCCCATTGA  CGTCAATGGG  AGTTTGTTTT  GGCACCAAAA
481  TCAACGGGAC  TTTCCAAAAT  GTCGTAACAA  CTCCGCCCCA  TTGACGCAA  TGGGCGGTAG
541  GCGTGTACGG  TGGGAGGTCT  ATATAAGCAG  AGCTCGTTTA  GTGAACCGTC  AGATCGCCTG
601  GAGACGCCAT  CCACGCTGTT  TTGACCTCCA  TAGAAGACAC  CGGGACCGAT  CCAGCCTCCG
661  GACTCTAGCC  TAGGCCGCGG  AGCGGATAAC  AATTCACAC  AGGAAACAGC  TATGACCATT
721  AGGCCTTTGC  AAAAAGCTAT  TTAGGTGACA  CTATAGAAGG  TACGCCTGCA  GGTACCGGAT
781  CACAAGTTTG  TACAAAAAAG  CTGAACGAGA  AACGTAAAAT  GATATAAATA  TCAATATATT
841  AAATTAGATT  TTGCATAAAA  AACAGACTAC  ATAATACTGT  AAAACACAAC  ATATCCAGTC
901  ACTATGGCGG  CCGCATTAGG  CACCCCAGGC  TTTACACTTT  ATGCTTCCGG  CTCGTATAAT
961  GTGTGGATTT  TGAGTTAGGA  TCCGTCGAGA  TTTTCAGGAG  CTAAGGAAGC  TAAAATGGAG
1021  AAAAAAATCA  CTGGATATAC  CACCGTTGAT  ATATCCCAAT  GGCATCGTAA  AGAACATTTT
1081  GAGGCATTTC  AGTCAGTTGC  TCAATGTACC  TATAACCAGA  CCGTTCAGCT  GGATATTACG
1141  GCCTTTTTTAA  AGACCGTAAA  GAAAAATAAG  CACAAGTTTT  ATCCGGCCTT  TATTCACATT
1201  CTTGCCCCGCC  TGATGAATGC  TCATCCGGAA  TTCCGTATGG  CAATGAAAGA  CGGTGAGCTG
1261  GTGATATGGG  ATAGTGTTCA  CCCTTGTTAC  ACCGTTTTTC  ATGAGCAAAC  TGAAACGTTT
1321  TCATCGCTCT  GGAGTGAATA  CCACGACGAT  TTCCGGCAGT  TTCTACACAT  ATATTCGCAA
1381  GATGTGGCGT  GTTACGGTGA  AAACCTGGCC  TATTTCCCTA  AAGGGTTTAT  TGAGAATATG
1441  TTTTTCGTCT  CAGCCAATCC  CTGGGTGAGT  TTCACCAGTT  TTGATTTAAA  CGTGGCCAAT
1501  ATGGACAACT  TCTTCGCCCC  CGTTTTACCC  ATGGGCAAAT  ATTATACGCA  AGGCGACAAG
1561  GTGCTGATGC  CGCTGGCGAT  TCAGGTTTCA  CATGCCGTCT  GTGATGGCTT  CCATGTCGGC
1621  AGAATGCTTA  ATGAATTACA  ACAGTACTGC  GATGAGTGGC  AGGGCGGGGC  GTAAACGCGT
1681  GGATCCGGCT  TACTAAAAGC  CAGATAACAG  TATGCGTATT  TGCGCGCTGA  TTTTTCGGT
1741  ATAAGAATAT  AACTGATAT  GTATACCCGA  AGTATGTCAA  AAAGAGGTGT  GCTATGAAGC
1801  AGCGTATTAC  AGTGACAGTT  GACAGCGACA  GCTATCAGTT  GCTCAAGGCA  TATATGATGT
1861  CAATATCTCC  GGTCTGGTAA  GCACAACCAT  GCAGAATGAA  GCCCGTCGTC  TGCGTGCCGA
1921  ACGCTGGAAA  GCGGAAAATC  AGGAAGGGAT  GGCTGAGGTC  GCCCGGTTTA  TTGAAATGAA
1981  CGGCTCTTTT  GCTGACGAGA  ACAGGGACTG  GTGAAATGCA  GTTTAAGGTT  TACACCTATA
2041  AAAGAGAGAG  CCGTTATCGT  CTGTTTGTGG  ATGTACAGAG  TGATATTATT  GACACGCCCC
2101  GGCGACGGAT  GGTGATCCCC  CTGGCCAGTG  CACGTCTGCT  GTCAGATAAA  GTCTCCCGTG
2161  AACTTTACCC  GGTGGTGCAT  ATCGGGGATG  AAAGCTGGCG  CATGATGACC  ACCGATATGG
2221  CCAGTG TGCC  GGTCTCCGTT  ATCGGGGAAG  AAGTGGCTGA  TCTCAGCCAC  CGCGAAAATG
2281  ACATCAAAAA  CGCCATTAAC  CTGATGTTCT  GGGGAATATA  AATGTCAGGC  TCCCTTATAC
2341  ACAGCCAGTC  TGCAGGTCGA  CCATAGTGAC  TGGATATGTT  GTGTTTTACA  GTATTATGTA
2401  GTCTGTTTTT  TATGCAAAAT  CTAATTTAAT  ATATTGATAT  TTATATCATT  TTACGTTTCT
2461  CGTTCAGCTT  TCTTGTACAA  AGTGGTGATC  GCGTGCATGC  GACGTCATAG  CTCTCTCCCT
2521  ATAGTGAGTC  GTATTATAAG  CTAGGCACTG  GCCGTCGTTT  TACAACGTCG  TGACTGGGAA-

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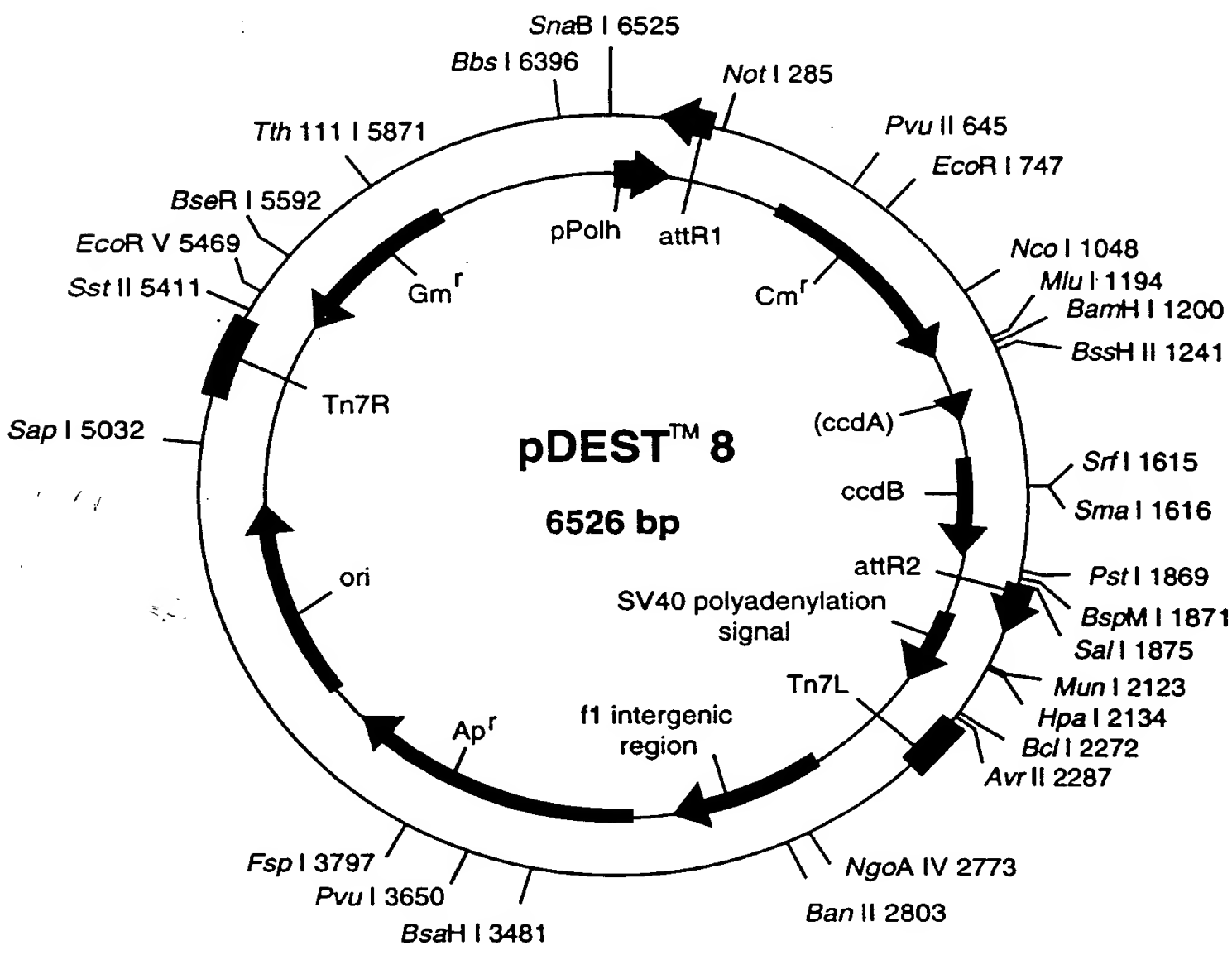
FIGURE 27B

2581	AACTGCTAGC	TTGGGATCTT	TGTGAAGGAA	CCTTACTTCT	GTGGTGTGAC	ATAATTGGAC
2641	AAACTACCTA	CAGAGATTTA	AAGCTCTAAG	GTAAATATAA	AATTTTTTAAG	TGTATAATGT
2701	GTTAAACTAG	CTGCATATGC	TTGCTGCTTG	AGAGTTTTTG	TTACTGAGTA	TGATTTTATGA
2761	AAATATTATA	CACAGGAGCT	AGTGATTCTA	ATTGTTTGTG	TATTTTAGAT	TCACAGTCCC
2821	AAGGCTCATT	TCAGGCCCCCT	CAGTCCTCAC	AGTCTGTTCA	TGATCATAAT	CAGCCATAACC
2881	ACATTTGTAG	AGGTTTTACT	TGCTTTAAAA	AACCTCCCAC	ACCTCCCCCT	GAACCTGAAA
2941	CATAAAATGA	ATGCAATTGT	TGTTGTTAAC	TTGTTTATTG	CAGCTTATAA	TGGTTACAAA
3001	TAAAGCAATA	GCATCACAAA	TTTCACAAAT	AAAGCATTTT	TTTCACTGCA	TTCTAGTTGT
3061	GGTTTGTCCA	AACTCATCAA	TGTATCTTAT	CATGTCTGGA	TCGATCCTGC	ATTAATGAAT
3121	CGGCCAACGC	GCGGGGAGAG	GCGGTTTGCG	TATTGGCTGG	CGTAATAGCG	AAGAGGCCCC
3181	CACCGATCGC	CCTTCCCAAC	AGTTGCGCAG	CCTGAATGGC	GAATGGGACG	CGCCCTGTAG
3241	CGGCGCATT	AGCGCGGCGG	GTGTGGTGGT	TACGCGCAGC	GTGACCGCTA	CACTTGCCAG
3301	CGCCCTAGCG	CCCCTCCTT	TCGCTTTCTT	CCCTTCCTTT	CTCGCCACGT	TCGCCGGCTT
3361	TCCCCGTCAA	GCTCTAAATC	GGGGGCTCCC	TTTAGGGTTC	CGATTTAGTG	CTTTACGGCA
3421	CCTCGACCCC	AAAAAACTTG	ATTAGGGTGA	TGGTTCACGT	AGTGGGCCAT	CGCCCTGATA
3481	GACGGTTTTT	CGCCCTTTGA	CGTTGGAGTC	CACGTTCTTT	AATAGTGGAC	TCTTGTTCCTA
3541	AACTGGAACA	ACACTCAACC	CTATCTCGGT	CTATTCTTTT	GATTTATAAG	GGATTTTGCC
3601	GATTTCTGGC	TATTGGTTAA	AAAATGAGCT	GATTTAACAA	AAATTTAACG	CGAATTTTAA
3661	CAAAATATTA	ACGTTTACAA	TTTCAGGTGG	CACTTTTTCGG	GGAAATGTGC	GCGGAACCCC
3721	TATTTGTTTA	TTTTTCTAAA	TACATTCAAA	TATGTATCCG	CTCATGCCAG	GTCTTGGA
3781	GGTGAGAACG	GCTTGCTCGG	CAGCTTCGAT	GTGTGCTGGA	GGGAGAATAA	AGGTCTAAGA
3841	TGTGCGATAG	AGGGAAGTCG	CATTGAATTA	TGTGCTGTGT	AGGGATCGCT	GGTATCAAAT
3901	ATGTGTGCCC	ACCCCTGGCA	TGAGACAATA	ACCCTGATAA	ATGCTTCAAT	AATATTGAAA
3961	AAGGAAGAGT	ATGAGTATTC	AACATTTCCG	TGTCGCCCTT	ATTCCCTTTT	TTGCGGCATT
4021	TTGCCTTCCT	GTTTTTGCTC	ACCCAGAAAC	GCTGGTGAAA	GTAAAAGATG	CTGAAGATCA
4081	GTTGGGTGCA	CGAGTGGGTT	ACATCGAACT	GGATCTCAAC	AGCGGTAAGA	TCCTTGAGAG
4141	TTTTCGCCCC	GAAGAACGTT	TTCCAATGAT	GAGCACTTTT	AAAGTTCTGC	TATGTGGCGC
4201	GGTATTATCC	CGTATTGACG	CCGGGCAAGA	GCAACTCGGT	CGCCGCATAC	ACTATTCTCA
4261	GAATGACTTG	GTTGAGTACT	CACCAGTCAC	AGAAAAGCAT	CTTACGGATG	GCATGACAGT
4321	AAGAGAATTA	TGCAGTGCTG	CCATAACCAT	GAGTGATAAC	ACTGCGGCCA	ACTTACTTCT
4381	GACAACGATC	GGAGGACCGA	AGGAGCTAAC	CGCTTTTTTG	CACAACATGG	GGGATCATGT
4441	AACTCGCCTT	GATCGTTGGG	AACCGGAGCT	GAATGAAGCC	ATACCAAACG	ACGAGCGTGA
4501	CACCACGATG	CCTGTAGCAA	TGGCAACAAC	GTTGCGCAAA	CTATTA	CTACTGCGAACT
4561	TACTCTAGCT	TCCCGGCAAC	AATTAATAGA	CTGGATGGAG	GCGGATAAAG	TTGCAGGACC
4621	ACTTCTGCGC	TCGGCCCTTC	CGGCTGGCTG	GTTTATTGCT	GATAAATCTG	GAGCCGGTGA
4681	GCGTGGGTCT	CGCGGTATCA	TTGCAGCACT	GGGGCCAGAT	GGTAAGCCCT	CCCGTATCGT
4741	AGTTATCTAC	ACGACGGGGA	GTCAGGCAAC	TATGGATGAA	CGAAATAGAC	AGATCGCTGA
4801	GATAGGTGCC	TC	ACTGATTA	AGCAT	TGGTA	ACTGTCAGAC
4861	TTAGATTGAT	TTAA	AACTTC	ATTTT	TAA	AAGGATC
4921	TAATCTCATG	CCATA	AACTTC	GTATA	ATGTA	TGCTATACGA
4981	CCCTTAACGT	GAGTTT	TTCGT	TCCACT	GTAG	ACCC
5041	TTCTTGAGAT	CCTTTT	TTTTT	TGCG	CGTAAT	CTGCTGCTTG
5101	ACCAGCGGTG	GTTTGT	TTTGC	CGGAT	CAAGA	GCTACCAACT
5161	CTTCAGCAGA	GCGCAG	ATAC	CAA	ATACTGT	CCTTCTAGTG
5221	CTTCAAGAAC	TCTGTAG	CAC	CGCCT	TACATA	CCTCGCTCTG
5281	TGCTGCCAGT	GGCGATA	AGT	CGTGT	CTTAC	CGGGTTGGAC
5341	TAAGGCGCAG	CGGTCGGG	CT	GAACGGGGG	TT	CGTG
5401	GACCTACACC	GA	ACTGAGAT	ACCTACAGCG	TGAGCATTGA	GAAAGCGCCA
5461	AGGGAGAAAG	GCGGACAGGT	ATCCGGTAAG	CGGCAGGGTC	GGAACAGGAG	AGCGCACGAG
5521	GGAGCTTCCA	GGGGGAAACG	CCTGGTATCT	TTATAGTCCT	GTCGGGT	TTT
5581	ACTTGAGCGT	CGATTTT	TGT	GATGCTCGTC	AGGGGGGCGG	AGCCTATGGA
5641	CAACGCGGCC	TTTTTACGGT	TCCTGGCCTT	TTGCTGGCCT	TTTGCTCACA	TGTTCTTTCC
5701	TGCGTTATCC	CCTGATTCTG	TGGATAACCG	TATTACCGCC	TTTGAGTGAG	CTGATACCGC
5761	TCGCCGCAGC	CGAACGACCG	AGCGCAGCGA	GTCAGTGAGC	GAGGAAGCGG	AAGAGCGCCC
5821	AATACGCAA	CCGCTCTCC	CCGCGCGTTG	GCCGATT	CAT	TAATGCAGAG
5881	GCGCGTTTTT	CAATATTATT	GAAGCATTTA	TCAGGGTTAT	TGTCTCATGA	GCGGATACAT
5941	ATTTGAATGT	ATTTAGAAAA	ATAAACAAAT	AGGGGTTCCG	CGCACAT	TTT
6001	GCCACCTGAC	GTCTAAGAAA	CCATT			

FIGURE 27C

Figure 28A: pDEST8 Polyhedron Promoter, Baculovirus Transfer Plasmid

1 **AccI**
cgt ata ctc cgg aat att aat aga tca tgg aga taa tta aaa tga taa cca
gca tat gag gcc tta taa tta tct agt acc tct att aat ttt act att ggt
52 tct cgc aaa taa ata ^{mRNA (polyhedrin)} agt att tta ctg ttt tgc taa cag ttt tgt aat aaa
aga gcg ttt att tat tca taa aat gac aaa agc att gtc aaa aca tta ttt
103 aaa acc tat aaa tat tcc gga tta ttc ata ccg tcc cac cat cgg gcg cgg
ttt tgg ata ttt ata agg cct aat aag tat ggc agg gtg gta gcc cgc gcc
154 **Bam** atc atc aca agt tgg ~~tac~~ ^{Int} ~~aaa~~ ~~aaa~~ ~~gct~~ ~~gaa~~ ~~cga~~ ~~gaa~~ ~~aag~~ ~~taa~~ ~~aat~~ ~~gat~~ ~~ata~~
tag tag ~~cgt~~ ~~tca~~ ~~aac~~ ~~atg~~ ~~ttt~~ ~~ttc~~ ~~cga~~ ~~ctt~~ ~~gct~~ ~~ctt~~ ~~tgc~~ ~~att~~ ~~tta~~ ~~cta~~ ~~tat~~



pDEST8 6526 bp

Location (Base Nos.)	Gene Encoded
23..152	Ppolh
284..160	attR1
534..1193	CmR
1313..1397	inactivated ccdA
1535..1840	ccdB
1881..2005	attR2
2766..3146	f1
3240..4090	ampR
4289..4869	ori
5564..6496	genR

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1 CGTATACTCC GGAATATTAA TAGATCATGG AGATAATTAA AATGATAACC ATCTCGCAAA
61 TAAATAAGTA TTTTACTGTT TTCGTAACAG TTTTGTAATA AAAAAACCTA TAAATATTCC
121 GGATTATTCA TACCGTCCCA CCATCGGGCG CGGATCATCA CAAGTTTGTA CAAAAAAGCT
181 GAACGAGAAA CGTAAAATGA TATAAATATC AATATATTAA ATTAGATTTT GCATAAAAAA
241 CAGACTACAT AATACTGTAA AACACAACAT ATCCAGTCAC TATGGCGGCC GCTAAGTTGG
301 CAGCATCACC CGACGCACTT TGCGCCGAAT AAATACCTGT GACGGAAGAT CACTTCGCAG
361 AATAAATAAA TCCTGGTGTC CCTGTTGATA CCGGGAAGCC CTGGGCCAAC TTTTGGCGAA
421 AATGAGACGT TGATCGGCAC GTAAGAGGTT CCAACTTTCA CCATAATGAA ATAAGATCAC
481 TACCGGGCGT ATTTTTTTGAG TTATCGAGAT TTTTCAGGAGC TAAGGAAGCT AAAATGGAGA
541 AAAAAATCAC TGGATATACC ACCGTTGATA TATCCCAATG GCATCGTAAA GAACATTTTG
601 AGGCATTTCA GTCAGTTGCT CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG
661 CCTTTTTTAAA GACCGTAAAG AAAAATAAGC ACAAGTTTTA TCCGGCCTTT ATTCACATTC
721 TTGCCCCGCT GATGAATGCT CATCCGGAAT TCCGTATGGC AATGAAAGAC GGTGAGCTGG
781 TGATATGGGA TAGTGTTTAC CCTTGTTACA CCGTTTTCCA TGAGCAAAC GAAACGTTTT
841 CATCGCTCTG GAGTGAATAC CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG
901 ATGTGGCGTG TTACGGTGAA AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT
961 TTTTCGTCTC AGCCAATCCC TGGGTGAGTT TCACCAGTTT TGATTTAAAC GTGGCCAATA
1021 TGGACAACCT CTTCGCCCCC GTTTTCACCA TGGGCAAATA TTATACGCAA GGCGACAAGG
1081 TGCTGATGCC GCTGGCGATT CAGGTTTCATC ATGCCGTCTG TGATGGCTTC CATGTCGGCA
1141 GAATGCTTAA TGAATTACAA CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG
1201 GATCCGGCTT ACTAAAAGCC AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA
1261 TAAGAATATA TACTGATATG TATACCCGAA GTATGTCAAA AAGAGGTGTG CTATGAAGCA
1321 GCGTATTACA GTGACAGTTG ACAGCGACAG CTATCAGTTG CTCAAGGCAT ATATGATGTC
1381 AATATCTCCG GTCTGGTAAG CACAACCATG CAGAATGAAG CCCGTCGTCT GCGTGCCGAA
1441 CGCTGGAAAG CGGAAAATCA GGAAGGGATG GCTGAGGTCG CCCGGTTTAT TGAAATGAAC
1501 GGCTCTTTTG CTGACGAGAA CAGGGACTGG TGAAATGCAG TTTAAGGTTT ACACCTATAA
1561 AAGAGAGAGC CGTTATCGTC TGTTTGTGGA TGTACAGAGT GATATTATTG ACACGCCCGG
1621 GCGACGGATG GTGATCCCCC TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA
1681 ACTTTACCCG GTGGTGCATA TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC
1741 CAGTGTGCCG GTCTCCGTTA TCGGGGAAGA AGTGGCTGAT CTCAGCCACC GCGAAAATGA
1801 CATCAAAAAC GCCATTAACC TGATGTTCTG GGGAATATAA ATGTCAGGCT CCCTTATACA
1861 CAGCCAGTCT GCAGGTCGAC CATAGTGAAT GGATATGTTG TGTTTTACAG TATTATGTAG
1921 TCTGTTTTTT ATGCAAAATC TAATTTAATA TATTGATATT TATATCATTT TACGTTTCTC
1981 GTTCAGCTTT CTTGTACAAA GTGGTGATAG CTTGTGCGAG AGTACTAGAG GATCATAATC
2041 AGCCATACCA CATTTGTAGA GGTTTTACTT GCTTTAAAAA ACCTCCCACA CCTCCCCCTG
2101 AACCTGAAAC ATAAAATGAA TGCAATTGTT GTTGTTAACT TGTTTATTGC AGCTTATAAT
2161 GGTTACAAAT AAAGCAATAG CATCACAAAT TTCACAAATA AAGCATTTTT TTCACTGCAT
2221 TCTAGTTGTG GTTTGTCCAA ACTCATCAAT GTATCTTATC ATGTCTGGAT CTGATCACTG
2281 CTTGAGCCTA GGAGATCCGA ACCAGATAAG TGAAATCTAG TTCCAAACTA TTTTGTCTAT
2341 TTTAATTTTC GTATTAGCTT ACGACGCTAC ACCCAGTTCC CATCTATTTT GTCACCTCTC
2401 CCTAAATAAT CCTTAAAAAC TCCATTTCCA CCCCTCCCAG TTCCCAACTA TTTTGTCCGC
2461 CCACAGCGGG GCATTTTTTCT TCCTGTTTATG TTTTAAATCA AACATCCTGC CAACTCCATG
2521 TGACAAACCG TCATCTTCGG CTACTTTTTC TCTGTCACAG AATGAAAATT TTTCTGTCAT-

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FIGURE 28B

2581 CTCTTCGTTA TTAATGTTTG TAATTGACTG AATATCAACG CTTATTTGCA GCCTGAATGG
2641 CGAATGGACG CGCCCTGTAG CGGCGCATTG AGCGCGGCGG GTGTGGTGGT TACGCGCAGC
2701 GTGACCGCTA CACTTGCCAG CGCCCTAGCG CCCGCTCCTT TCGCTTTCTT CCCTTCCTTT
2761 CTCGCCACGT TCGCCGGCTT TCCCCGTCAA GCTCTAAATC GGGGGCTCCC TTTAGGGTTC
2821 CGATTTAGTG CTTTACGGCA CCTCGACCCC AAAAACTTG ATTAGGGTGA TGGTTCACGT
2881 AGTGGGCCAT CGCCCTGATA GACGGTTTTT CGCCCTTTGA CGTTGGAGTC CACGTTCTTT
2941 AATAGTGGAC TCTTGTTCCA AACTGGAACA AACTCAACC CTATCTCGGT CTATTCTTTT
3001 GATTTATAAG GGATTTTGCC GATTTTCGGC TATTGGTTAA AAAATGAGCT GATTTAACAA
3061 AAATTTAACG CGAATTTTAA CAAAATATTA ACGTTTACAA TTTCAGGTGG CACTTTTCGG
3121 GGAAATGTGC GCGGAACCCC TATTTGTTTA TTTTCTAAA TACATTCAA TATGTATCCG
3181 CTCATGAGAC AATAACCCTG ATAAATGCTT CAATAATATT GAAAAAGGAA GAGTATGAGT
3241 ATTCAACATT TCCGTGTGCG CCTTATTCCC TTTTTTGCGG CATTTTGCCT TCCTGTTTTT
3301 GCTCACCCAG AAACGCTGGT GAAAGTAAAA GATGCTGAAG ATCAGTTGGG TGCACGAGTG
3361 GGTACATCG AACTGGATCT CAACAGCGGT AAGATCCTTG AGAGTTTTCG CCCCGAAGAA
3421 CGTTTTCCAA TGATGAGCAC TTTTAAAGTT CTGCTATGTG GCGCGGTATT ATCCCGTATT
3481 GACGCCGGGC AAGAGCAACT CGGTCGCCGC ATACACTATT CTCAGAATGA CTTGGTTGAG
3541 TACTCACCAG TCACAGAAAA GCATCTTACG GATGGCATGA CAGTAAGAGA ATTATGCAGT
3601 GCTGCCATAA CCATGAGTGA TAACACTGCG GCCAACTTAC TTCTGACAAC GATCGGAGGA
3661 CCGAAGGAGC TAACCGCTTT TTTGCACAAC ATGGGGGATC ATGTAACTCG CCTTGATCGT
3721 TGGGAACCGG AGCTGAATGA AGCCATACCA AACGACGAGC GTGACACCAC GATGCCTGTA
3781 GCAATGGCAA CAACGTTGCG CAAACTATTA ACTGGCGAAC TACTTACTCT AGCTTCCCGG
3841 CAACAATTAA TAGACTGGAT GGAGGCGGAT AAAGTTGCAG GACCACTTCT GCGCTCGGCC
3901 CTTCCGGCTG GCTGGTTTAT TGCTGATAAA TCTGGAGCCG GTGAGCGTGG GTCTCGCGGT
3961 ATCATTGCAG CACTGGGGCC AGATGGTAAG CCTTCCCGTA TCGTAGTTAT CTACACGACG
4021 GGGAGTCAGG CAACTATGGA TGAACGAAAT AGACAGATCG CTGAGATAGG TGCCTCACTG
4081 ATTAAGCATT GGTAAGTGTG AGACCAAGTT TACTCATATA TACTTTAGAT TGATTTAAAA
4141 CTTCATTTTT AATTTAAAAG GATCTAGGTG AAGATCCTTT TTGATAATCT CATGACCAAA
4201 ATCCCTTAAC GTGAGTTTTT GTTCCACTGA GCGTCAGACC CCGTAGAAAA GATCAAAGGA
4261 TCTTCTTGAG ATCCTTTTTT TCTGCGCGTA ATCTGCTGCT TGCAAACAAA AAAACCACCG
4321 CTACCAGCGG TGGTTTGT TTGCCGATCAA GAGCTACCAA CTCTTTTTCC GAAGGTAAGT
4381 GGCTTCAGCA GAGCGCAGAT ACCAAATACT GTCCTTCTAG TGTAGCCGTA GTTAGGCCAC
4441 CACTTCAAGA ACTCTGTAGC ACCGCCTACA TACCTCGCTC TGCTAATCCT GTTACCAGTG
4501 GCTGCTGCCA GTGGCGATAA GTCGTGTCTT ACCGGGTTGG ACTCAAGACG ATAGTTACCG
4561 GATAAGGCGC AGCGGTCGGG CTGAACGGGG GGTTCGTGCA CACAGCCCAG CTTGGAGCGA
4621 ACGACCTACA CCGAACTGAG ATACCTACAG CGTGAGCATT GAGAAAGCGC CACGCTTCCC
4681 GAAGGGAGAA AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCACG
4741 AGGGAGCTTC CAGGGGGAAA CGCCTGGTAT CTTTATAGTC CTGTCGGGTT TCGCCACCTC
4801 TGACTTGAGC GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAAACGCC
4861 AGCAACGCGG CCTTTTTTACG GTTCCTGGCC TTTTGCTGGC CTTTGTCTCA CATGTTCTTT
4921 CCTGCGTTAT CCCCTGATTC TGTGGATAAC CGTATTACCG CCTTTGAGTG AGCTGATACC
4981 GCTCGCCGCA GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGAGCGC
5041 CTGATGCGGT ATTTTCTCCT TACGCATCTG TGCGGTATTT CACACCGCAG ACCAGCCGCG
5101 TAACCTGGCA AAATCGGTTA CGGTTGAGTA ATAAATGGAT GCCCTGCGTA AGCGGGTGTG
5161 GGCGGACAAT AAAGTCTTAA ACTGAACAAA ATAGATCTAA ACTATGACAA TAAAGTCTTA
5221 AACTAGACAG AATAGTTGTA AACTGAAATC AGTCCAGTTA TGCTGTGAAA AAGCATACTG
5281 GACTTTTGTT ATGGCTAAAG CAAACTCTTC ATTTTCTGAA GTGCAAATTG CCCGTCGTAT
5341 TAAAGAGGGG CGTGGCCAAG GGCATGGTAA AGACTATATT CGCGGCGTTG TGACAATTTA
5401 CCGAACAACCT CCGCGGCCGG GAAGCCGATC TCGGCTTGAA CGAATTGTTA GGTGGCGGTA
5461 CTTGGGTCGA TATCAAAGTG CATCACTTCT TCCCGTATGC CCAACTTTGT ATAGAGAGCC
5521 ACTGCGGGAT CGTCACCGTA ATCTGCTTGC ACGTAGATCA CATAAGCACC AAGCGCGTTG
5581 GCCTCATGCT TGAGGAGATT GATGAGCGCG GTGGCAATGC CCTGCCTCCG GTGCTCGCCG
5641 GAGACTGCGA GATCATAGAT ATAGATCTCA CTACGCGGCT GCTCAAACCT GGGCAGAACG
5701 TAAGCCGCGA GAGCGCCAAC AACCGCTTCT TGGTCGAAGG CAGCAAGCGC GATGAATGTC
5761 TTAATACGGA GCAAGTTCCC GAGGTAATCG GAGTCCGGCT GATGTTGGGA GTAGGTGGCT
5821 ACGTCTCCGA ACTCACGACC GAAAAGATCA AGAGCAGCCC GCATGGATTT GACTTGGTCA
5881 GGGCCGAGCC TACATGTGCG AATGATGCCC ATACTTGAGC CACCTAACTT TGTTTTAGGG
5941 CGACTGCCCT GCTGCGTAAC ATCGTTGCTG CTGCGTAACA TCGTTGCTGC TCCATAACAT
6001 CAAACATCGA CCCACGGCGT AACGCGCTTG CTGCTTGGAT GCCCGAGGCA TAGACTGTAC-

FIGURE 28C

6061 AAAAAACAG TCATAACAAG CCATGAAAAC CGCCACTGCG CCGTTACCAC CGCTGCGTTC
6121 GGTCAAGGTT CTGGACCAGT TGCGTGAGCG CATA CGCTAC TTGCATTACA GTTTACGAAC
6181 CGAACAGGCT TATGTCAACT GGGTTCGTGC CTTTCATCCGT TTCCACGGTG TGCCTCACCC
6241 GGCAACCTTG GGCAGCAGCG AAGTCGAGGC ATTTCTGTCC TGGCTGGCGA ACGAGCGCAA
6301 GGTTCGGTC TCCACGCATC GTCAGGCATT GGCAGCCTTG CTGTTCTTCT ACGGCAAGGT
6361 GCTGTGCACG GATCTGCCCT GGCTTCAGGA GATCGGAAGA CCTCGGCCGT CGCGGCGCTT
6421 GCCGGTGGTG CTGACCCCGG ATGAAGTGGT TCGCATCCTC GGTTTTCTGG AAGGCGAGCA
6481 TCGTTTGTTT GCCCAGGACT CTAGCTATAG TTCTAGTGGT TGGCTA

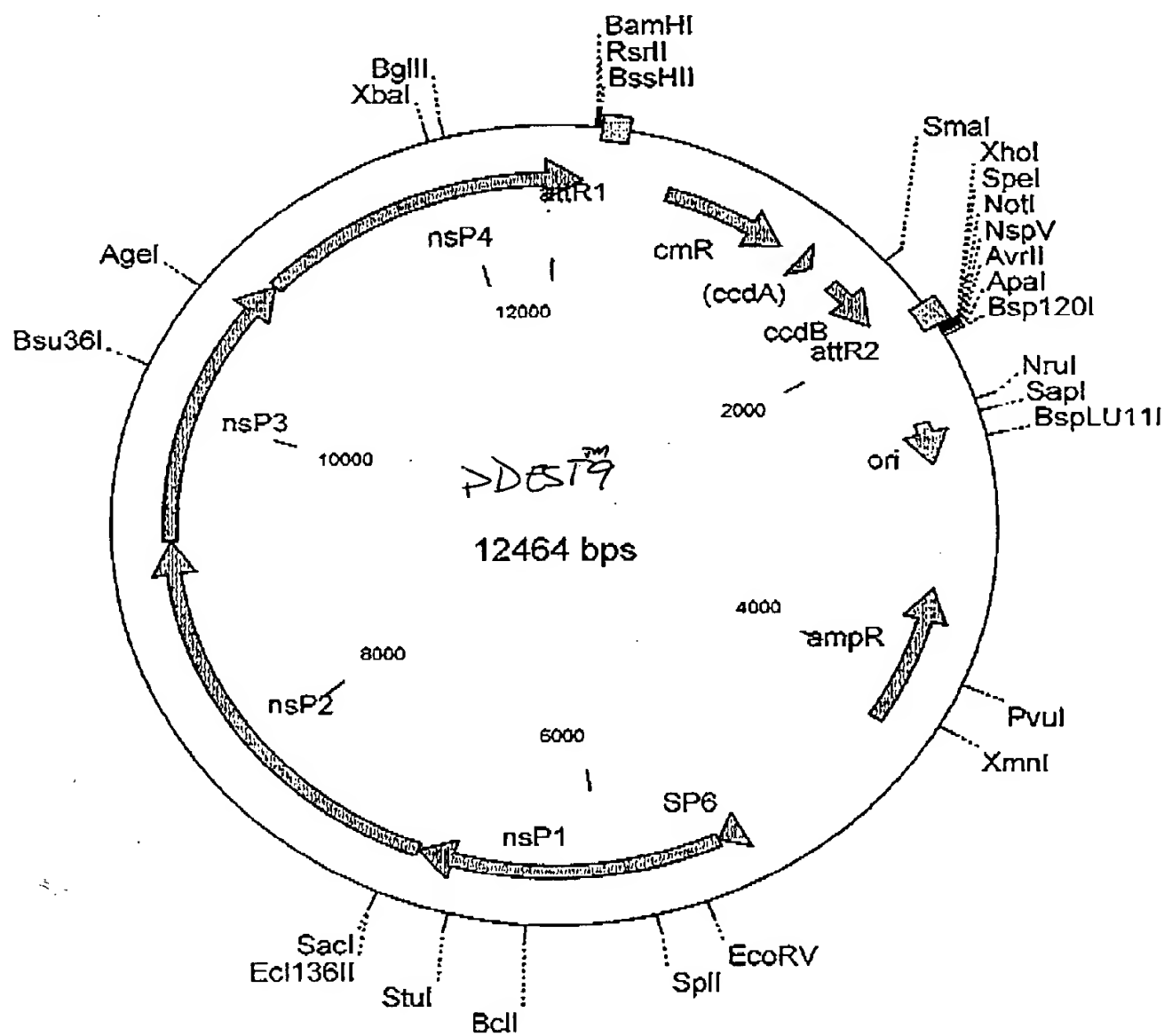
CGCTGCGTTC

FIGURE 28D

Figure 29A: pDEST9

Semliki Forest Virus vector

103 ttg gcg agg gac att aag gcg ttt aag aaa ttg aga gga cct gtt ata gac
 aac cgc tcc ctg taa ttc cgc aaa ttc ttt aac tct cct gga caa tat gtg
 243 promoter → 265 RNA
 154 ctc tac ggc ggt cct aga ttg gtc cgt taa tac aca gaa ttc tga ttg gat
 gag atg ccg cca gga tct aac cac gca att atg tgt ctt aag act aac cta
 RsrII
 205 ccc ggt ccg aag cgc gct ttc cca tca aca agt tgg/tac aag aag gct gaa
 ggg cca ggc ttc gcg cga aag ggt agt tgt tca aac atg ttt ttc cga ctc
 Igt attR1



003060 00427660

pDEST9 12464 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
355..232	attR1
605..1264	CmR
1384..1468	inactivated ccdA
1606..1911	ccdB
1952..2078	attR2
2532..2782	ori
3482..4282	ampR
5232..5365	SP6 promoter
5365..6965	nsP1:non-structural protein 1
6965..9265	nsP2:non-structural protein 2
9265..10865	nsP3:non-structural protein 3
10865..161	nsP4:non-structural protein 4

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1 AGCAAGTGGT TCCGGACAGG CTTGGGGGCC GAACTGGAGG TGGCACTAAC ATCTAGGTAT
61 GAGGTAGAGG GCTGCAAAAG TATCCTCATA GCCATGGCCA CCTTGCGGAG GGACATTAAG
121 GCGTTTAAGA AATTGAGAGG ACCTGTTATA CACCTCTACG GCGGTCCTAG ATTGGTGCGT
181 TAATACACAG AATTCTGATT GGATCCCGGT CCGAAGCGCG CTTTCCCATC ACAAGTTTGT
241 ACAAAAAAGC TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT
301 TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC
361 CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG TGACGGAAGA
421 TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC CCTGGGCCAA
481 CTTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAAC TTTC ACCATAATGA
541 AATAAGATCA CTACCGGGCG TATTTTTTTGA GTTATCGAGA TTTTCAGGAG CTAAGGAAGC
601 TAAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA
661 AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT
721 GGATATTACG GCCTTTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT ATCCGGCCTT
781 TATTCACATT CTTGCCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA
841 CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTTC ATGAGCAAAC
901 TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT
961 ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT
1021 TGAGAAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAAGT TTGATTTAAA
1081 CGTGGCCAAT ATGGACAAC TCTTCGCCCC CGTTTTTACC ATGGGCAAAT ATTATACGCA
1141 AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTCAT CATGCCGTCT GTGATGGCTT
1201 CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC
1261 GTAAAGATCT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT TGCGCGCTGA
1321 TTTTTCGGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT
1381 GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA
1441 TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA GCCCGTCGTC
1501 TGCGTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCCCGGTTTA
1561 TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT
1621 TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG TGATATTATT
1681 GACACGCCCC GCGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT GTCAGATAAA
1741 GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG CATGATGACC
1801 ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA TCTCAGCCAC
1861 CGCGAAAATG ACATCAAAAA CGCCATTAAC CTGATGTTCT GGGGAATATA AATGTCAGGC
1921 TCCCTTATAC ACAGCCAGTC TGCAGGTCGA CCATAGTGAC TGGATATGTT GTGTTTTACA
1981 GTATTATGTA GTCTGTTTTT TATGCAAAAG TGCTAATTTA ATATATTGAT ATTTATATCA
2041 TTTTACGTTT CTCGTTACAG TTTCTTGTAC AAAGTGGTGA TGGGAAC TCG AGTTCACTAG
2101 TCGATCCCGC GGCCGCTTTC GAACCTAGGC AAGCATGCGG GCCCAGTGGG TAATTAATTG
2161 AATTACATCC CTACGCAAAC GTTTTACGGC CGCCGGTGGC GCCCGCGCCC GGCGGCCCGT
2221 CCTTGGCCGT TGCAGGCCAC TCCGGTGGCT CCCGTCGTCC CCGACTTCCA GGCCAGCAG
2281 ATGCAGCAAC TCATCAGCGC CGTAAATGCG CTGACAATGA GACAGAACGC AATTGCTCCT
2341 GCTAGGAGCT TAATTCGACG AATAATTGGA TTTTATT TTT ATTTTGCAAT TGGTTTTTAA
2401 TATTTCCAAA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA-

```

FIGURE 29B

2461 AAAAAAAAAA AAAAAAACTA GAAATCGCGA TTTCTAGTCT GCATTAATGA ATCGGCCAAC
 2521 GCGCGGGGAG AGGCGGTTTG CGTATTGGGC GCTCTTCCGC TTCCTCGCTC ACTGACTCGC
 2581 TGCCTCGGT CGTTCGGCTG CGGCGAGCGG TATCAGCTCA CTCAAAGGCG GTAATACGGT
 2641 TATCCACAGA ATCAGGGGAT AACGCAGGAA AGAACATGTG AGCAAAAGGC CAGCAAAAGG
 2701 CCAGGAACCG TAAAAAGGCC GCGTTGCTGG CGTTTTTCCA TAGGCTCCGC CCCCTGACG
 2761 AGCATCACAA AAATCGACGC TCAAGTCAGA GGTGGCGAAA CCCGACAGGA CTATAAAGAT
 2821 ACCAGGCGTT TCCCCCTGGA AGCTCCCTCG TGCCTCTCC TGTTCGACC CTGCCGCTTA
 2881 CCGGATACCT GTCCGCCTTT CTCCCTTCGG GAAGCGTGGC GCTTTCTCAA TGCTCGCGCT
 2941 GTAGGTATCT CAGTTCGGTG TAGGTCTGTT GCTCCAAGCT GGGCTGTGTG CACGAACCCC
 3001 CCGTTCAGCC CGACCGCTGC GCCTTATCCG GTAACATATC TCTTGAGTCC AACCCGGTAA
 3061 GACACGACTT ATCGCCACTG GCAGCAGCCA CTGGTAACAG GATTAGCAGA GCGAGGTATG
 3121 TAGGCGGTGC TACAGAGTTC TTGAAGTGGT GGCCTAACTA CGGCTACACT AGAAGGACAG
 3181 TATTTGGTAT CTGCGCTCTG CTGAAGCCAG TTACCTTCGG AAAAAGAGTT GGTAGCTCTT
 3241 GATCCGGCAA ACAAACCACC GCTGGTAGCG GTGGTTTTTT TGTGTGCAAG CAGCAGATTA
 3301 CGCGCAGAAA AAAAGGATCT CAAGAAGATC CTTTGATCTT TTCTACGGGG TCTGACGCTC
 3361 AGTGGAACGA AAATCACGT TAAGGGATTT TGGTCATGAG ATTATCAAAA AGGATCTTCA
 3421 CCTAGATCCT TTAAATTA AAATGAAGTT TTAAATCAAT CTAAAGTATA TATGAGTAAA
 3481 CTTGGTCTGA CAGTTACCAA TGCTTAATCA GTGAGGCACC TATCTCAGCG ATCTGTCTAT
 3541 TTCGTTTCAT CATAGTTGCC TGAATCCCCG TCGTGTAGAT AACTACGATA CGGGAGGGCT
 3601 TACCATCTGG CCCCAGTGCT GCAATGATAC CGCGAGACCC ACGCTCACC GCTCCAGATT
 3661 TATCAGCAAT AAACCAGCCA GCCGGAAGGG CCGAGCGCAG AAGTGGTCCT GCAACTTTAT
 3721 CCGCCTCCAT CCAGTCTATT AATTGTTGCC GGAAGCTAG AGTAAGTAGT TCGCCAGTTA
 3781 ATAGTTTGCG CAACGTTGTT GCCATTGCTA CAGGCATCGT GGTGTCACGC TCGTCGTTTG
 3841 GTATGGCTTC ATTCAGCTCC GGTTCCTAAC GATCAAGGCG AGTTACATGA TCCCCCATGT
 3901 TGTGCAAAAA AGCGGTTAGC TCCTTCGGTC CTCCGATCGT TGTCAGAAGT AAGTTGGCCG
 3961 CAGTGTTATC ACTCATGGTT ATGGCAGCAC TGCATAATTC TCTTACTGTC ATGCCATCCG
 4021 TAAGATGCTT TTCTGTGACT GGTGAGTACT CAACCAAGTC ATTCTGAGAA TAGTGTATGC
 4081 GGCGACCGAG TTGCTCTTGC CCGGCGTCAA TACGGGATAA TACCGCGCCA CATAGCAGAA
 4141 CTTTAAAAGT GCTCATCATT GGAAAACGTT CTTCGGGGCG AAAACTCTCA AGGATCTTAC
 4201 CGCTGTTGAG ATCCAGTTTC ATGTAACCCA CTCGTGCACC CAACTGATCT TCAGCATCTT
 4261 TTACTTTTAC CAGCGTTTCT GGGTGAGCAA AAACAGGAAG GCAAAATGCC GCAAAAAGG
 4321 GAATAAGGGC GACACGGAAA TGTTGAATAC TCATACTCTT CTTTTTTCAA TATTATTGAA
 4381 GCATTTATCA GGGTTATTGT CTCATGAGCG GATACATATT TGAATGTATT TAGAAAAATA
 4441 AACAAATAGG GGTTCGCGC ACATTTCCCC GAAAAGTGCC ACCTGACGTC TAAGAAACCA
 4501 TTATTATCAT GACATTAACC TATAAAAATA GGCGTATCAC GAGGCCCTTT CGTCTCGCGC
 4561 GTTTCGGTGA TGACGGTGAA AACCTCTGAC ACATGCAGCT CCCGGAGACG GTCACAGCTT
 4621 CTGTCTAAGC GGATGCCGGG AGCAGACAAG CCCGTCAGGG CGCGTCAGCG GGTGTTGGCG
 4681 GGTGTCGGGG CTGGCTTAAC TATGCGGCAT CAGAGCAGAT TGTACTGAGA GTGCACCATA
 4741 TCGACGCTCT CCCTTATGCG ACTCCTGCAT TAGGAAGCAG CCCAGTACTA GGTGAGGCC
 4801 GTTGAGCACC GCCGCCGCAA GGAATGGTGC ATGCAAGGAG ATGGCGCCCA ACAGTCCCCC
 4861 GGCCACGGGG CCTGCCACCA TACCCACGCC GAAACAAGCG CTCATGAGCC CGAAGTGGCG
 4921 AGCCCGATCT TCCCCATCGG TGATGTCGGC GATATAGGCG CCAGCAACCG CACCTGTGGC
 4981 GCCGGTGATG CCGGCCACGA TCGTCCGGC GTAGAGGATC TGGCTAGCGA TGACCCTGCT
 5041 GATTGGTTTC CTGACCATTT CCGGGGTGCG GAACGGCGTT ACCAGAACT CAGAAGGTTT
 5101 GTCCAACCAA ACCGACTCTG ACGGCAGTTT ACGAGAGAGA TGATAGGGTC TGCTTCAGTA
 5161 AGCCAGATGC TACACAATTA GGCTTGTTACA TATTGTCTGTT AGAACGCGGC TACAATTAAT
 5221 ACATAACCTT ATGTATCATA CACATACGAT TTAGGTGACA CTATAGATGG CGGATGTGTG
 5281 ACATACACGA CGCCAAAAGA TTTTGTTCCTA GCTCCTGCCA CCTCCGCTAC GCGAGAGATT
 5341 AACCACCCAC GATGGCCGCC AAAGTGCATG TTGATATTGA GGCTGACAGC CCATTCATCA
 5401 AGTCTTTGCA GAAGGCATTT CCGTCGTTTC AGGTGGAGTC ATTGCAGGTC ACACCAAATG
 5461 ACCATGCAAA TGCCAGAGCA TTTTCGCACC TGGCTACCAA ATTGATCGAG CAGGAGACTG
 5521 ACAAAGACAC ACTCATCTTG GATATCGGCA GTGCGCCTTC CAGGAGAATG ATGTCTACGC
 5581 ACAAATACCA CTGCGTATGC CCTATGCGCA GCGCAGAAGA CCCCAGAAAG CTCGATAGCT
 5641 ACGCAAAGAA ACTGGCAGCG GCCTCCGGGA AGGTGCTGGA TAGAGAGATC GCAGGAAAAA
 5701 TCACCGACCT GCAGACCGTC ATGGCTACGC CAGACGCTGA ATCTCCTACC TTTTGCCTGC
 5761 ATACAGACGT CACGTGTCTG ACGGCAGCCG AAGTGGCCGT ATACCAGGAC GTGTATGCTG
 5821 TACATGCACC AACATCGCTG TACCATCAGG CGATGAAAGG TGTCAGAACG GCGTATTGGA
 5881 TTGGGTTTGA CACCACCCCG TTTATGTTTG ACGCGCTAGC AGGCGCGTAT CCAACCTACG-

FIGURE 29C

5941 CCACAAACTG GGCCGACGAG CAGGTGTTAC AGGCCAGGAA CATAGGACTG TGTGCAGCAT
6001 CCTTGACTGA GGAAGACTC GGCAAACTGT CCATTCTCCG CAAGAAGCAA TTGAAACCTT
6061 GCGACACAGT CATGTTCTCG GTAGGATCTA CATTGTACAC TGAGAGCAGA AAGCTACTGA
6121 GGAGCTGGCA CTTACCCTCC GTATTCCACC TGAAAGGTAA ACAATCCTTT ACCTGTAGGT
6181 GCGATACCAT CGTATCATGT GAAGGGTACG TAGTTAAGAA AATCACTATG TGCCCCGGCC
6241 TGTACGGTAA AACGGTAGGG TACGCCGTGA CGTATCACGC GGAGGGATTG CTAGTGTGCA
6301 AGACCACAGA CACTGTCAAA GGAGAAAGAG TCTCATTTCC TGTATGCACC TACGTCCCCT
6361 CAACCATCTG TGATCAAATG ACTGGCATACTAGCGACCGA CGTCACACCG GAGGACGCAC
6421 AGAAGTTGTT AGTGGGATTG AATCAGAGGA TAGTTGTGAA CGGAAGAACA CAGCGAAACA
6481 CTAACACGAT GAAGAACTAT CTGCTTCCGA TTGTGGCCGT CGCATTTAGC AAGTGGGCGA
6541 GGAATACAA GGCAGACCTT GATGATGAAA AACCTCTGGG TGTCCGAGAG AGGTCACCTA
6601 CTTGCTGCTG CTTGTGGGCA TTTAAACGA GGAAGATGCA CACCATGTAC AAGAAACCAG
6661 ACACCCAGAC AATAGTGAAG GTGCCTTCAG AGTTTAACTC GTTCGTCATC CCGAGCCTAT
6721 GGTCTACAGG CCTCGCAATC CCAGTCAGAT CACGCATTAA GATGCTTTTG GCCAAGAAGA
6781 CCAAGCGAGA GTTAATACCT GTTCTCGACG CGTCGTCAGC CAGGGATGCT GAACAAGAGG
6841 AGAAGGAGAG GTTGGAGGCC GAGCTGACTA GAGAAGCCTT ACCACCCCTC GTCCCCATCG
6901 CGCCGGCGGA GACGGGAGTC GTCGACGTCG ACGTTGAAGA ACTAGAGTAT CACGCAGGTG
6961 CAGGGGTCGT GGAAACACCT CGCAGCGCGT TGAAAGTCAC CGCACAGCCG AACGACGTAC
7021 TACTAGGAAA TTACGTAGTT CTGTCCCCGC AGACCGTGCT CAAGAGCTCC AAGTTGGCCC
7081 CCGTGCACCC TCTAGCAGAG CAGGTGAAAA TAATAACACA TAACGGGAGG GCCGGCGGTT
7141 ACCAGGTCGA CGGATATGAC GGCAGGGTCC TACTACCATG TGGATCGGCC ATTCCGGTCC
7201 CTGAGTTTCA GGCTTTGAGC GAGAGCGCCA CTATGGTGTA CAACGAAAGG GAGTTCGTCA
7261 ACAGGAACT ATACCATATT GCCGTTACG GACCCTCGCT GAACACCGAC GAGGAGAACT
7321 ACGAGAAAGT CAGAGCTGAA AGAACTGACG CCGAGTACGT GTTCGACGTA GATAAAAAAT
7381 GCTGCGTCAA GAGAGAGGAA GCGTCGGGTT TGGTGTTGGT GGGAGAGCTA ACCAACCCCC
7441 CGTTCCATGA ATTCGCCTAC GAAGGGCTGA AGATCAGGCC GTCGGCACCA TATAAGACTA
7501 CAGTAGTAGG AGTCTTTGGG GTTCCGGGAT CAGGCAAGTC TGCTATTATT AAGAGCCTCG
7561 TGACCAAACA CGATCTGGTC ACCAGCGGCA AGAAGGAGAA CTGCCAGGAA ATAGTTAACG
7621 ACGTGAAGAA GCACCGCGGG AAGGGGACAA GTAGGGAAAA CAGTGACTCC ATCCTGCTAA
7681 ACGGGTGTCG TCGTGCCGTG GACATCCTAT ATGTGGACGA GGCTTTTCGT TGCCATTCCG
7741 GTACTCTGCT GGCCCTAATT GCTCTTGTTA AACCTCGGAG CAAAGTGGTG TTATGCGGAG
7801 ACCCAAGCA ATGCGGATTC TTCAATATGA TGCAGCTTAA GGTGAACTTC AACCACAACA
7861 TCTGCACTGA AGTATGTCAT AAAAGTATAT CCAGACGTTG CACGCGTCCA GTCACGGCCA
7921 TCGTGTCTAC GTTGCACTAC GGAGGCAAGA TGCGCACGAC CAACCCGTGC AACAAACCCA
7981 TAATCATAGA CACCACAGGA CAGACCAAGC CCAAGCCAGG AGACATCGTG TTAACATGCT
8041 TCCGAGGCTG GGCAAAGCAG CTGCAGTTGG ACTACCGTGG ACACGAAGTC ATGACAGCAG
8101 CAGCATCTCA GGGCCTCACC CGCAAAGGGG TATACGCCGT AAGGCAGAAG GTGAATGAAA
8161 ATCCCTTGTA TGCCCCTGCG TCGGAGCACG TGAATGTACT GCTGACGCGC ACTGAGGATA
8221 GGCTGGTGTG GAAAACGCTG GCCGGCGATC CCTGGATTAA GGTCCCTATCA AACATTCCAC
8281 AGGGTAACTT TACGGCCACA TTGGAAGAAT GGCAAGAAGA ACACGACAAA ATAATGAAGG
8341 TGATTGAAGG ACCGGCTGCG CCTGTGGACG CGTTCCAGAA CAAAGCGAAC GTGTGTTGGG
8401 CGAAAAGCCT GGTGCCTGTC CTGGACACTG CCGGAATCAG ATTGACAGCA GAGGAGTGGA
8461 GCACCATAAT TACAGCATTT AAGGAGGACA GAGCTTACTC TCCAGTGGTG GCCTTGAATG
8521 AAATTTGCAC CAAGTACTAT GGAGTTGACC TGGACAGTGG CCTGTTTTCT GCCCCGAAGG
8581 TGTCCCTGTA TTACGAGAAC AACCCTGGG ATAACAGACC TGGTGGAAGG ATGTATGGAT
8641 TCAATGCCGC AACAGCTGCC AGGCTGGAAG CTAGACATAC CTTCTGAAG GGGCAGTGGC
8701 ATACGGGCAA GCAGGCAGTT ATCGCAGAAA GAAAAATCCA ACCGCTTTCT GTGCTGGACA
8761 ATGTAATTCC TATCAACCGC AGGCTGCCGC ACGCCCTGGT GGCTGAGTAC AAGACGGTTA
8821 AAGGCAGTAG GGTTGAGTGG CTGGTCAATA AAGTAAGAGG GTACCACGTC CTGCTGGTGA
8881 GTGAGTACAA CCTGGCTTTG CCTCGACGCA GGGTCACTTG GTTGTCACCG CTGAATGTCA
8941 CAGGCGCCGA TAGGTGCTAC GACCTAAGTT TAGGACTGCC GGCTGACGCC GGCAGGTTCCG
9001 ACTTGGTCTT TGTGAACATT CACACGGAAT TCAGAATCCA CCACTACCAG CAGTGTGTCTG
9061 ACCACGCCAT GAAGCTGCAG ATGCTTGGGG GAGATGCGCT ACGACTGCTA AAACCCGGCG
9121 GCATCTTGAT GAGAGCTTAC GGATACGCCG ATAAAATCAG CGAAGCCGTT GTTTCCTCCT
9181 TAAGCAGAAA GTTCTCGTCT GCAAGAGTGT TGCGCCCGGA TTGTGTCACC AGCAATACAG
9241 AAGTGTTCTT GCTGTTCTCC AACTTTGACA ACGGAAAGAG ACCCTCTACG CTACACCAGA
9301 TGAATACCAA GCTGAGTGCC GTGTATGCCG GAGAAGCCAT GCACACGGCC GGGTGTGCAC
9361 CATCCTACAG AGTTAAGAGA GCAGACATAG CCACGTGCAC AGAAGCGGCT GTGGTTAACG-

FIGURE 29A

9421 CAGCTAACGC CCGTGGAAC TTAGGGGATG GCGTATGCAG GGCCGTGGCG AAGAAATGGC
 9481 CGTCAGCCTT TAAGGGAGCA GCAACACCAG TGGGCACAAT TAAACAGTC ATGTGCGGCT
 9541 CGTACCCCGT CATCCACGCT GTAGCGCCTA ATTTCTCTGC CACGACTGAA GCGGAAGGGG
 9601 ACCGCGAATT GGCCGCTGTC TACCGGGCAG TGGCCGCCGA AGTAAACAGA CTGTCACTGA
 9661 GCAGCGTAGC CATCCCGCTG CTGTCCACAG GAGTGTTCAG CGGCGGAAGA GATAGGCTGC
 9721 AGCAATCCCT CAACCATCTA TTCACAGCAA TGGACGCCAC GGACGCTGAC GTGACCATCT
 9781 ACTGCAGAGA CAAAAGTTGG GAGAAGAAAA TCCAGGAAGC CATTGACATG AGGACGGCTG
 9841 TGGAGTTGCT CAATGATGAC GTGGAGCTGA CCACAGACTT GGTGAGAGTG CACCCGGACA
 9901 GCAGCCTGGT GGGTCGTAAG GGCTACAGTA CCACTGACGG GTCGCTGTAC TCGTACTTTG
 9961 AAGGTACGAA ATTCAACCAG GCTGCTATTG ATATGGCAGA GATACTGACG TTGTGGCCCA
 10021 GACTGCAAGA GGCAAACGAA CAGATATGCC TATACGCGCT GGGCGAAACA ATGGACAACA
 10081 TCAGATCCAA ATGTCCGGTG AACGATTCCG ATTCATCAAC ACCTCCCAGG ACAGTGCCCT
 10141 GCCTGTGCCG CTACGCAATG ACAGCAGAAC GGATCGCCCG CCTTAGGTCA CACCAAGTTA
 10201 AAAGCATGGT GGTTCGCTCA TCTTTTCCCC TCCCGAAATA CCATGTAGAT GGGGTGCAGA
 10261 AGGTAAAGTG CGAGAAGGTT CTCCTGTTCTG ACCCGACGGT ACCTTCAGTG GTTAGTCCGC
 10321 GGAAGTATGC CGCATCTACG ACGGACCACT CAGATCGGTC GTTACGAGGG TTTGACTTGG
 10381 ACTGGACCAC CGACTCGTCT TCCACTGCCA GCGATACCAT GTCGCTACCC AGTTTGCACT
 10441 CGTGTGACAT CGACTCGATC TACGAGCCAA TGGCTCCCAT AGTAGTGACG GCTGACGTAC
 10501 ACCCTGAACC CGCAGGCATC GCGGACCTGG CGGCAGATGT GCACCCTGAA CCCGCAGACC
 10561 ATGTGGACCT GGAGAACCCG ATTCCTCCAC CGCGCCCGAA GAGAGCTGCA TACCTTGCCT
 10621 CCCGCGCGGC GGAGCGACCG GTGCCGGCGC CGAGAAAGCC GACGCCTGCC CCAAGGACTG
 10681 CGTTTAGGAA CAAGCTGCCT TTGACGTTCTG GCGACTTTGA CGAGCACGAG GTCGATGCGT
 10741 TGGCCTCCGG GATTACTTTC GGAGACTTCG ACGACGTCCT GCGACTAGGC CGCGCGGGTG
 10801 CATATATTTT CTCCTCGGAC ACTGGCAGCG GACATTTACA ACAAATATCC GTTAGGCAGC
 10861 ACAATCTCCA GTGCGCACAA CTGGATGCGG TCCAGGAGGA GAAATGTAC CCGCCAAAT
 10921 TGGATACTGA GAGGGAGAAG CTGTTGCTGC TGAAAATGCA GATGCACCCA TCGGAGGCTA
 10981 ATAGAGTCG ATACCAGTCT CGCAAAGTGG AGAACATGAA AGCCACGGTG GTGGACAGGC
 11041 TCACATCGGG GGCCAGATTG TACACGGGAG CGGACGTAGG CCGCATACCA ACATACGCGG
 11101 TTCGGTACCC CCGCCCCGTG TACTCCCCTA CCGTGATCGA AAGATTCTCA AGCCCCGATG
 11161 TAGCAATCGC AGCGTGCAAC GAATACCTAT CCAGAAATTA CCAACAGTG GCGTCGTACC
 11221 AGATAACAGA TGAATACGAC GCATACTTGG ACATGGTTGA CGGGTCGGAT AGTTGCTTGG
 11281 ACAGAGCGAC ATTCTGCCCC GCGAAGCTCC GGTGCTACCC GAAACATCAT GCGTACCACC
 11341 AGCCGACTGT ACGCAGTGCC GTCCCGTCAC CCTTTCAGAA CACACTACAG AACGTGCTAG
 11401 CGGCTGCCAC CAAGAGAAAC TGCAACGTCA CGCAAATGCG AGAACTACCC ACCATGGACT
 11461 CGGCAGTGTT CAACGTGGAG TGCTTCAAGC GCTATGCCTG CTCCGGAGAA TATTGGGAAG
 11521 AATATGCTAA ACAACCTATC CGGATAACCA CTGAGAACAT CACTACCTAT GTGACCAAAT
 11581 TGAAAGGCCC GAAAGCTGCT GCCTTGTTCT CTAAGACCCA CAACTTGGTT CCGCTGCAGG
 11641 AGGTTCCCAT GGACAGATTC ACGGTCGACA TGAAACGAGA TGTCAAAGTC ACTCCAGGGA
 11701 CGAAACACAC AGAGGAAAGA CCCAAAGTCC AGGTAATTCA AGCAGCGGAG CCATTGGCGA
 11761 CCGCTTACCT GTGCGGCATC CACAGGGAAT TAGTAAGGAG ACTAAATGCT GTGTTACGCC
 11821 CTAACGTGCA CACATTGTTT GATATGTCGG CCGAAGACTT TGACGCGATC ATCGCCTCTC
 11881 ACTTCCACCC AGGAGACCCG GTTCTAGAGA CGGACATTGC ATCATTCGAC AAAAGCCAGG
 11941 ACGACTCCTT GGCTCTTACA GGTTTAATGA TCCTCGAAGA TCTAGGGGTG GATCAGTACC
 12001 TGCTGGACTT GATCGAGGCA GCCTTTGGGG AAATATCCAG CTGTCACCTA CCAACTGGCA
 12061 CGCGCTTCAA GTTCGGAGCT ATGATGAAAT CGGGCATGTT TCTGACTTTG TTTATTAACA
 12121 CTGTTTTGAA CATCACCATA GCAAGCAGGG TACTGGAGCA GAGACTCACT GACTCCGCCT
 12181 GTGCGGCCTT CATCGGCGAC GACAACATCG TTCACGGAGT GATCTCCGAC AAGCTGATGG
 12241 CGGAGAGGTG CGCGTCGTGG GTCAACATGG AGGTGAAGAT CATTGACGCT GTCATGGGCG
 12301 AAAAACCCCC ATATTTTGTG GGGGGATTCA TAGTTTTTGA CAGCGTCACA CAGACCGCCT
 12361 GCCGTGTTTC AGACCCACTT AAGCGCCTGT TCAAGTTGGG TAAGCCGCTA ACAGCTGAAG
 12421 ACAAGCAGGA CGAAGACAGG CGACGAGCAC TGAGTGACGA GGTT

FIGURE 29E

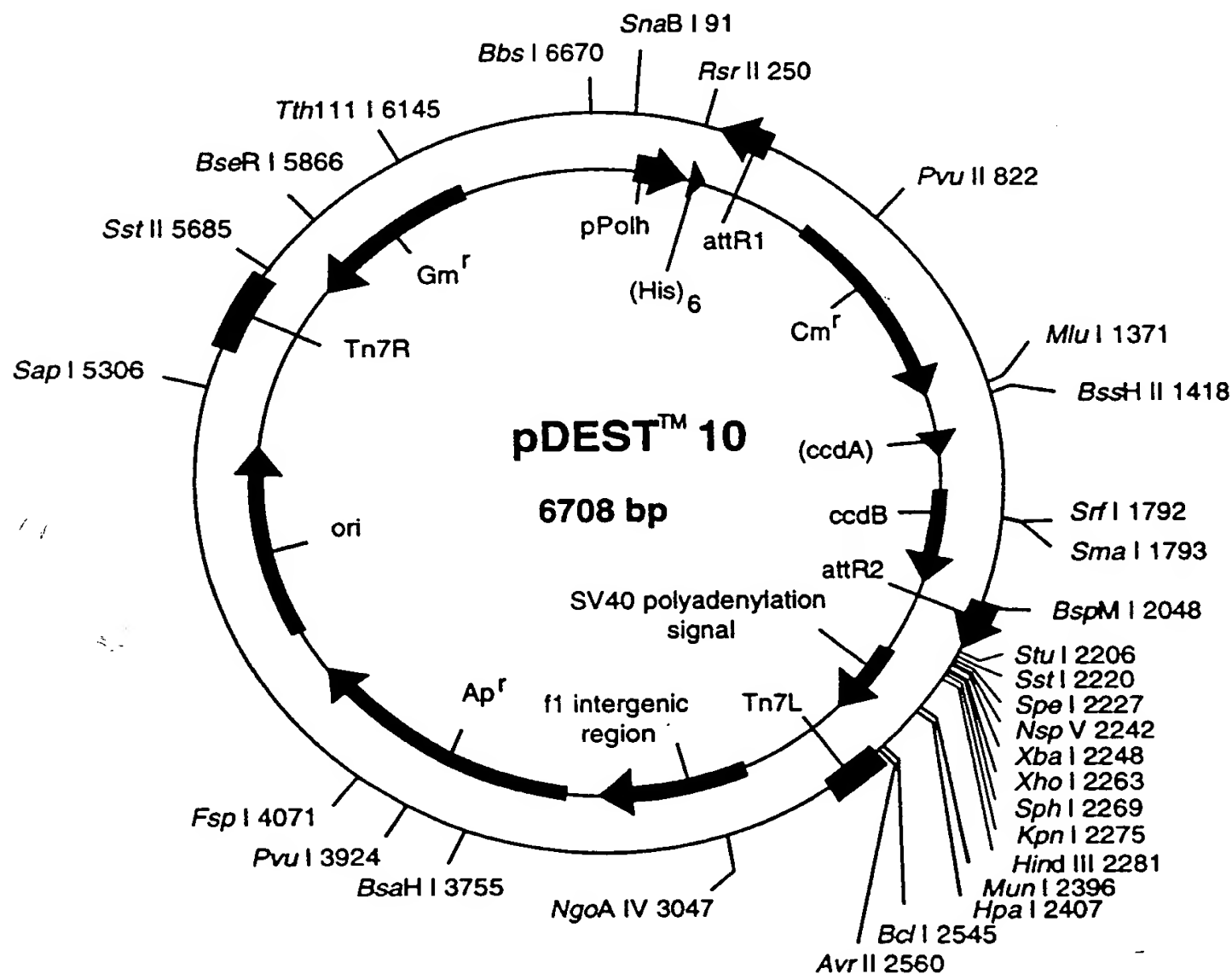
Figure 30A: pDEST10 Polyhedron Promoter with N-His6, Baculovirus Transfer Plasmid

154 *← mRut from polyhedrin promoter*
aaa taa gta ttt tac tgt ttt cgt aac agt ttt gta ata aaa aaa cct ata
ttt att cat aaa atg aca aaa gca ttg tca aaa cat tat ttt ttt gga tat

205
aat att ccg gat tat tca tac cgt ccc acc atc ggg cgc gga tct cgg tcc
tta taa ggc cta ata agt atg gca ggg tgg tag ccc gcg cct aga gcc agg

256
gaa acc Met Ser Tyr Tyr His His His His His Asp Tyr Asp Ile Pro
ctt tgg tac agc atg atg gta gtg gta gtg gta gtg cta atg cta tag ggt

307
Tyr Thr Glu Asn Leu Tyr Phe Gln Gly Ile Thr Ser Leu Tyr Lys Lys
acg acc gaa aac ctg tat ttt cag ggc atc aca agt ttg tac ada aaa gct
tgc tgg ctt ttg gac ata aaa gtc ccg tag tgt tca aac atg ttt ttc oga
attR1 Int



pDEST10 6708 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
23..152	Ppolh
461..337	attR1
711..1370	CmR
1490..1574	inactivated ccdA
1712..2017	ccdB
2058..2182	attR2
3394..4369	ampR
4510..5164	ori
5658..62	genR

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1  CCCC GGATGA AGTGGTTCGC ATCCTCGGTT TTCTGGAAGG CGAGCATCGT TTGTTCGCCC
61 AGGACTCTAG CTATAGTTCT AGTGGTTGGC TACGTATACT CCGGAATATT AATAGATCAT
121 GGAGATAATT AAAATGATAA CCATCTCGCA AATAAATAAG TATTTTACTG TTTTCGTAAC
181 AGTTTTGTAA TAAAAAAACC TATAAATATT CCGGATTATT CATAACGTCC CACCATCGGG
241 CGCGGATCTC GGTCCGAAAC CATGTCGTAC TACCATCACC ATCACCATCA CGATTACGAT
301 ATCCCAACGA CCGAAAACCT GTATTTTCAG GGCATCACAA GTTTGTACAA AAAAGCTGAA
361 CGAGAAACGT AAAATGATAT AAATATCAAT ATATTAAATT AGATTTTGCA TAAAAAACAG
421 ACTACATAAT ACTGTAAAAC ACAACATATC CAGTCACTAT GCGGCGCGCT AAGTTGGCAG
481 CATCACCCGA CGCACTTTGC GCCGAATAAA TACCTGTGAC GGAAGATCAC TTCGCAGAAT
541 AAATAAATCC TGGTGTCCCT GTTGATACCG GGAAGCCCTG GGCCAAC TTT TGGCGAAAAT
601 GAGACGTTGA TCGGCACGTA AGAGGTTCCA ACTTTCACCA TAATGAAATA AGATCACTAC
661 CGGGCGTATT TTTTGAGTTA TCGAGATTTT CAGGAGCTAA GGAAGCTAAA ATGGAGAAAA
721 AAATCACTGG ATATAACCACC GTTGATATAT CCAATGGCA TCGTAAAGAA CATTTTGAGG
781 CATTTTCAGTC AGTTGCTCAA TGTACCTATA ACCAGACCGT TCAGCTGGAT ATTACGGCCT
841 TTTTAAAGAC CGTAAAGAAA AATAAGCACA AGTTTATATCC GGCCTTTATT CACATTCTTG
901 CCCGCCTGAT GAATGCTCAT CCGGAATTCC GTATGGCAAT GAAAGACGGT GAGCTGGTGA
961 TATGGGATAG TGTTCAACCCT TGTTACACCG TTTTCCATGA GCAAAC TGAA AC GTTTTTCAT
1021 CGCTCTGGAG TGAATACCAC GACGATTTCC GGCAGTTTCT ACACATATAT TCGCAAGATG
1081 TGGCGTGTTA CGGTGAAAAC CTGGCCTATT TCCCTAAAGG GTTTATTGAG AATATGTTTT
1141 TCGTCTCAGC CAATCCCTGG GTGAGTTTCA CCAGTTTGA TTTAAACGTG GCCAATATGG
1201 ACAACTTCTT CGCCCCCGTT TTCACCATGG GCAAATATTA TACGCAAGGC GACAAGGTGC
1261 TGATGCCGCT GCGGATTCAG GTTCATCATG CCGTCTGTGA TGGCTTCCAT GTCGGCAGAA
1321 TGCTTAATGA ATTACAACAG TACTGCGATG AGTGGCAGGG CGGGGCGTAA ACGCGTGGAT
1381 CCGGCTTACT AAAAGCCAGA TAACAGTATG CGTATTTGCG CGCTGATTTT TGCGGTATAA
1441 GAATATATAC TGATATGTAT ACCCGAAGTA TGTCAAAAAG AGGTGTGCTA TGAAGCAGCG
1501 TATTACAGTG ACAGTTGACA GCGACAGCTA TCAGTTGCTC AAGGCATATA TGATGTCAAT
1561 ATCTCCGGTC TGGTAAGCAC AACCATGCAG AATGAAGCCC GTCGTCTGCG TGCCGAACGC
1621 TGGAAAGCGG AAAATCAGGA AGGGATGGCT GAGGTCGCCC GGTTTATTGA AATGAACGGC
1681 TCTTTTGCTG ACGAGAACAG GGA CTGGTGA AATGCAGTTT AAGGTTTACA CCTATAAAAG
1741 AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA CGCCCGGGCG
1801 ACGGATGGTG ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT CCCGTGAACT
1861 TTACCCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG ATATGGCCAG
1921 TGTGCCGGTC TCCGTTATCG GGAAGAAGT GGCTGATCTC AGCCACCGCG AAAATGACAT
1981 CAAAAACGCC ATTAACCTGA TGTCTGGGG AATATAAATG TCAGGCTCCC TTATACACAG
2041 CCAGTCTGCA GGTCGACCAT AGTGACTGGA TATGTTGTGT TTTACAGTAT TATGTAGTCT
2101 GTTTTTTATG CAAAATCTAA TTTAATATAT TGATATTTAT ATCATTTTAC GTTCTCTGTT
2161 CAGCTTTCTT GTACAAAGTG GTGATGCCAT GGATCCGGAA TTCAAAGGCC TACGTCGACG
2221 AGCTCAACTA GTGCGGCCGC TTTCGAATCT AGAGCCTGCA GTCTCGAGGC ATGCGGTACC
2281 AAGCTTGTCG AGAAGTACTA GAGGATCATA ATCAGCCATA CCACATTTGT AGAGGTTTTA
2341 CTTGCTTTAA AAAACCTCCC ACACCTCCCC CTGAACCTGA AACATAAAAT GAATGCAATT
2401 GTTGTTGTTA ACTTGTTTAT TGCAGCTTAT AATGGTTACA AATAAAGCAA TAGCATCACA
2461 AATTTACAA ATAAAGCATT TTTTCTACTG CATTCTAGTT GTGGTTTGTC CAACTCATC
2521 AATGTATCTT ATCATGTCTG GATCTGATCA CTGCTTGAGC CTAGGAGATC CGAACCAGAT
2581 AAGTGAAATC TAGTTCCAAA CTATTTTGTC ATTTTAAATT TTCGTATTAG CTTACGACGC-

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FIGURE 30B

2641 TACACCCAGT TCCCATCTAT TTTGTCACTC TTCCCTAAAT AATCCTTAAA AACTCCATTT
2701 CCACCCCTCC CAGTTCCCAA CTATTTTGTC CGCCACAGC GGGGCATTTT TCTTCCTGTT
2761 ATGTTTTTAA TCAAACATCC TGCCAACTCC ATGTGACAAA CCGTCATCTT CGGCTACTTT
2821 TTCTCTGTCA CAGAATGAAA ATTTTCTGT CATCTCTTCG TTATTAATGT TTGTAATTGA
2881 CTGAATATCA ACGCTTATTT GCAGCCTGAA TGGCGAATGG GACGCGCCCT GTAGCGGCGC
2941 ATTAAGCGCG GCGGGTGTGG TGGTTACGCG CAGCGTGACC GCTACACTTG CCAGCGCCCT
3001 AGCGCCCGCT CCTTTCGCTT TCTTCCCTTC CTTTCTCGCC ACGTTCGCCG GCTTTCCTCG
3061 TCAAGCTCTA AATCGGGGGC TCCCTTTAGG GTTCCGATTT AGTGCTTTAC GGCACCTCGA
3121 CCCCCAAAAA CTTGATTAGG GTGATGGTTC ACGTAGTGGG CCATCGCCCT GATAGACGGT
3181 TTTTCGCCCT TTGACGTTGG AGTCCACGTT CTTTAATAGT GGACTCTTGT TCCAAACTGG
3241 AACAACTC AACCCTATCT CGGTCTATTC TTTTGATTTA TAAGGGATTT TGCCGATTTT
3301 GGCCTATTGG TTAAAAAATG AGCTGATTTA ACAAATAATTT AACGCGAATT TTAACAAAAT
3361 ATTAACGTTT ACAATTTTCA GTGGCACTTT TCGGGGAAAT GTGCGCGGAA CCCCTATTTG
3421 TTTATTTTTT TAAATACATT CAAATATGTA TCCGCTCATG AGACAATAAC CCTGATAAAT
3481 GCTTCAATAA TATTGAAAAA GGAAGAGTAT GAGTATTCAA CATTTCCGTG TCGCCCTTAT
3541 TCCCTTTTTT GCGGCATTTT GCCTTCCTGT TTTTGCTCAC CCAGAAACGC TGGTGAAAGT
3601 AAAAGATGCT GAAGATCAGT TGGGTGCACG AGTGGGTAC ATCGAACTGG ATCTCAACAG
3661 CGGTAAGATC CTTGAGAGTT TTCGCCCCGA AGAACGTTTT CCAATGATGA GCACTTTTAA
3721 AGTTCTGCTA TGTGGCGCGG TATTATCCCG TATTGACGCC GGGCAAGAGC AACTCGGTGC
3781 CCGCATACAC TATTCTCAGA ATGACTTGGT TGAGTACTCA CCAGTCACAG AAAAGCATCT
3841 TACGGATGGC ATGACAGTAA GAGAATTATG CAGTGCTGCC ATAACCATGA GTGATAACAC
3901 TGCGGCCAAC TTACTTCTGA CAACGATCGG AGGACCGAAG GAGCTAACCG CTTTTTTTGA
3961 CAACATGGGG GATCATGTAA CTCGCCTTGA TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT
4021 ACCAAACGAC GAGCGTGACA CCACGATGCC TGTAGCAATG GCAACAACGT TGCGCAAACT
4081 ATTAAGTGGC GAACTACTTA CTCTAGCTTC CCGGCAACAA TTAATAGACT GGATGGAGGC
4141 GGATAAAGTT GCAGGACCAC TTCTGCGCTC GGCCCTTCCG GCTGGCTGGT TTATTGCTGA
4201 TAAATCTGGA GCCGGTGAGC GTGGGTCTCG CCGTATCATT GCAGCACTGG GGCCAGATGG
4261 TAAGCCCTCC CGTATCGTAG TTATCTACAC GACGGGGAGT CAGGCAACTA TGGATGAACG
4321 AAATAGACAG ATCGCTGAGA TAGGTGCCTC ACTGATTAAG CATTTGGTAA TGTCAGACCA
4381 AGTTTACTCA TATATACTTT AGATTGATTT AAAACTTCAT TTTTAATTTA AAAGGATCTA
4441 GGTGAAGATC CTTTTTGATA ATCTCATGAC CAAAATCCCT TAACGTGAGT TTTCGTTCCA
4501 CTGAGCGTCA GACCCCGTAG AAAAGATCAA AGGATCTTCT TGAGATCCTT TTTTCTGCG
4561 CGTAATCTGC TGCTTGCAAA CAAAAAACC ACCGCTACCA GCGGTGGTTT GTTTGCCGGA
4621 TCAAGAGCTA CCAACTCTTT TTCCGAAGGT AACTGGCTTC AGCAGAGCGC AGATACCAAA
4681 TACTGTCTTT CTAGTGTAGC CGTAGTTAGG CCACCACTTC AAGAACTCTG TAGCACCGCC
4741 TACATACCTC GCTCTGCTAA TCCTGTTACC AGTGGCTGCT GCCAGTGGCG ATAAGTCGTG
4801 TCTTACCGGG TTGGACTCAA GACGATAGTT ACCGGATAAG GCGCAGCGGT CGGGCTGAAC
4861 GGGGGGTTTC TGCACACAGC CCAGCTTGGG GCGAACGACC TACACCGAAC TGAGATACCT
4921 ACAGCGTGAG CATTGAGAAA GCGCCACGCT TCCCGAAGGG AGAAAGGCGG ACAGGTATCC
4981 GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG CACGAGGGAG CTTCCAGGGG GAAACGCCTG
5041 GTATCTTTAT AGTCCTGTCT GGTTCGCCA CCTCTGACTT GAGCGTCGAT TTTTGTGATG
5101 CTCGTCAGGG GGGCGGAGCC TATGGAAAAA CGCCAGCAAC GCGGCCTTTT TACGGTTCCT
5161 GGCCTTTTTG TGGCCTTTTG CTCACATGTT CTTTCCTGCG TTATCCCCTG ATTCTGTGGA
5221 TAACCGTATT ACCGCCTTTG AGTGAGCTGA TACCGCTCGC CGCAGCCGAA CGACCGAGCG
5281 CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA GCGCCTGATG CCGTATTTTC TCCTTACGCA
5341 TCTGTGCGGT ATTTACACAC GCAGACCAGC CGCGTAACCT GGCAAAATCG GTTACGGTTG
5401 AGTAATAAAT GGATGCCCTG CGTAAGCGGG TGTGGGCGGA CAATAAAGTC TTAAACTGAA
5461 CAAAATAGAT CTAAACTATG ACAATAAAGT CTTAAACTAG ACAGAATAGT TGTAAGTGA
5521 AATCAGTCCA GTTATGCTGT GAAAAAGCAT ACTGGACTTT TGTTATGGCT AAAGCAAACCT
5581 CTTCAATTTT TGAAGTGCAA ATTGCCCGTC GTATTAAAGA GGGGCGTGGC CAAGGGCATG
5641 GTAAAGACTA TATTCGCGGC GTTGAGACAA TTTACCGAAC AACTCCGCGG CCGGGAAGCC
5701 GATCTCGGCT TGAACGAATT GTTAGGTGGC GGTACTTGGG TCGATATCAA AGTGCATCAC
5761 TTCTTCCCGT ATGCCCAACT TTGTATAGAG AGCCACTGCG GGATCGTCAC CGTAATCTGC
5821 TTGCACGTAG ATCACATAAG CACCAAGCGC GTTGGCCTCA TGCTTGAGGA GATTGATGAG
5881 CGCGGTGGCA ATGCCCTGCC TCCGGTGCTC GCCGGAGACT GCGAGATCAT AGATATAGAT
5941 CTCCTACGCG GGCTGCTCAA ACCTGGGCAG AACGTAAGCC GCGAGAGCGC CAACAACCGC
6001 TTCTTGGTCG AAGGCAGCAA GCGCGATGAA TGTCTTACTA CGGAGCAAGT TCCCGAGGTA
6061 ATCGGAGTCC GGCTGATGTT GGGAGTAGGT GGCTACGTCT CCGAACTCAC GACCGAAAAG-

Figure 31A:

pDEST11

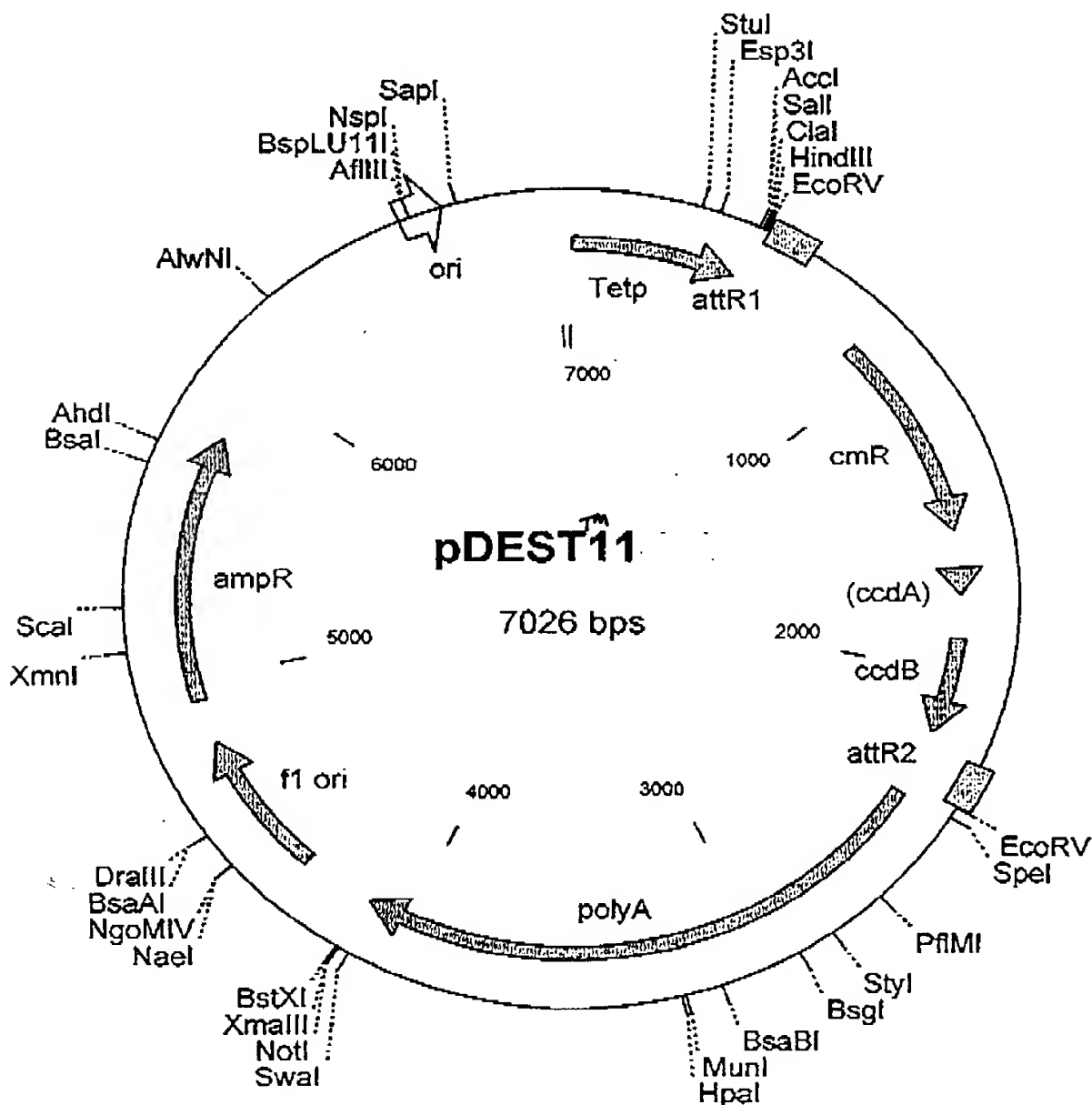
Tet-regulated eukaryotic expression

358 tag tga acc gfc ^{mRNA from CMV promoter (controlled by tetracycline)} aga tgc cct gga gac gcc atc cac gct gtt ttg acc tcc
 atc act tgg cag tct agc gga cct ctg cgg tag gtg cga caa aac tgg agg

409 ata gaa gac acc ggg acc gat cca gcc tcc gcg gcc ccg aat tgc agc tgc
 tat ctt ctg tgg ccc tgg cta ggt cgg agg cgc cgg ggc tta agc tgc agc

460 gta ccc ggg gat cct cta gag tgc agg ^{Sal} tgc acg gta ^{Cla} tgc ata ^{Hind3} agc ttg ^{EcoRV} ata
 cat ggg ccc cta gga gat ctc agc tcc agc tgc cat agc tat tgc agc tat

511 tca ^{Int} aca agt ^{attR1} ttg ~~gag aag aaa ggt gaa cga gaa acg taa~~ ~~aat gat ata aat~~
 agt ~~tgt tca aac atg ttt tct cga ctt gct ctt tgc att tta cta tat tta~~



pDEST11 7026 bp

Location (Base Nos.)
4..479

Gene Encoded
Tetp ((Tet operator)7 and min
hCMV promoter

638..514
888..1547
1667..1751
1889..2194
2235..2359
2402..4132
4347..4803
4940..5797

attR1
CmR
inactivated ccdA
ccdB
attR2
polyA
f1 ori
ampR

1 CGAGTTTACC ACTCCCTATC AGTGATAGAG AAAAGTGAAA GTCGAGTTTA CCACTCCCTA
61 TCAGTGATAG AGAAAAGTGA AAGTCGAGTT TACCACTCCC TATCAGTGAT AGAGAAAAGT
121 GAAAGTCGAG TTTACCACTC CCTATCAGTG ATAGAGAAAA GTGAAAGTCG AGTTTACCAC
181 TCCCTATCAG TGATAGAGAA AAGTGAAAGT CGAGTTTACC ACTCCCTATC AGTGATAGAG
241 AAAAGTGAAA GTCGAGTTTA CCACTCCCTA TCAGTGATAG AGAAAAGTGA AAGTCGAGCT
301 CGGTACCCGG GTCGAGTAGG CGTGTACGGT GGGAGGCCCTA TATAAGCAGA GCTCGTTTAG
361 TGAACCGTCA GATCGCCTGG AGACGCCATC CACGCTGTTT TGACCTCCAT AGAAGACACC
421 GGGACCGATC CAGCCTCCGC GGCCCCGAAT TCGAGCTCGG TACCCGGGGA TCCTCTAGAG
481 TCGAGGTCGA CGGTATCGAT AAGCTTGATA TCAACAAGTT TGTACAAAAA AGCTGAACGA
541 GAAACGTAAA ATGATATAAA TATCAATATA TTAAATTAGA TTTTGCATAA AAAACAGACT
601 ACATAATACT GTAAAACACA ACATATCCAG TCACTATGGC GGCCGCTAAG TTGGCAGCAT
661 CACCCGACGC ACTTTGCGCC GAATAAATAC CTGTGACGGA AGATCACTTC GCAGAATAAA
721 TAAATCCTGG TGTCCCTGTT GATACCGGGA AGCCCTGGGC CAACTTTTGG CGAAAATGAG
781 ACGTTGATCG GCACGTAAGA GGTTCCTAAT TTCACCATAA TGAAATAAGA TCACTACCGG
841 GCGTATTTTT TGAGTTATCG AGATTTTTCAG GAGCTAAGGA AGCTAAAATG GAGAAAAAAA
901 TCACTGGATA TACCACCGTT GATATATCCC AATGGCATCG TAAAGAACAT TTTGAGGCAT
961 TTCAGTCAGT TGCTCAATGT ACCTATAACC AGACCGTTCA GCTGGATATT ACGGCCTTTT
1021 TAAAGACCGT AAAGAAAAAT AAGCACAAGT TTTATCCGGC CTTTATTCAC ATTCTTGCCC
1081 GCCTGATGAA TGCTCATCCG GAATTCCGTA TGGCAATGAA AGACGGTGAG CTGGTGATAT
1141 GGGATAGTGT TCACCCTTGT TACACCGTTT TCCATGAGCA AACTGAAACG TTTTCATCGC
1201 TCTGGAGTGA ATACCACGAC GATTTCCGGC AGTTTCTACA CATATATTTC CAAGATGTGG
1261 CGTGTTACGG TGAAAACCTG GCCTATTTCC CTAAAGGGTT TATTGAGAAT ATGTTTTTCG
1321 TCTCAGCCAA TCCCTGGGTG AGTTTCACCA GTTTTGATTT AAACGTGGCC AATATGGACA
1381 ACTTCTTCGC CCCCCTTTTC ACCATGGGCA AATATTATAC GCAAGGCGAC AAGGTGCTGA
1441 TGCCGCTGGC GATTCAGGTT CATCATGCCG TCTGTGATGG CTTCCATGTC GGCAGAATGC
1501 TTAATGAATT ACAACAGTAC TGCGATGAGT GGCAGGGCGG GCGGTAAAGA TCTGGATCCG
1561 GCTTACTAAA AGCCAGATAA CAGTATGCGT ATTTGCGCGC TGATTTTTGC GGTATAAGAA
1621 TATATACTGA TATGTATACC CGAAGTATGT CAAAAAGAGG TGTGCTATGA AGCAGCGTAT
1681 TACAGTGACA GTTGACAGCG ACAGCTATCA GTTGCTCAAG GCATATATGA TGTCAATATC
1741 TCCGGTCTGG TAAGCACAAC CATGCAGAAT GAAGCCCGTC GTCTGCGTGC CGAACGCTGG
1801 AAAGCGGAAA ATCAGGAAGG GATGGCTGAG GTCGCCCCGT TTATTGAAAT GAACGGCTCT
1861 TTTGCTGACG AGAACAGGGA CTGGTGAAAT GCAGTTTAAG GTTTACACCT ATAAAAGAGA
1921 GAGCCGTTAT CGTCTGTTTG TGGATGTACA GAGTGATATT ATTGACACGC CCGGGCGACG
1981 GATGGTGATC CCCCTGGCCA GTGCACGTCT GCTGTCAGAT AAAGTCTCCC GTGAACTTTA
2041 CCCGGTGGTG CATATCGGGG ATGAAAGCTG GCGCATGATG ACCACCGATA TGGCCAGTGT
2101 GCCGGTCTCC GTTATCGGGG AAGAAGTGGC TGATCTCAGC CACCGCGAAA ATGACATCAA
2161 AAACGCCATT AACCTGATGT TCTGGGGAAT ATAAATGTCA GGCTCCCTTA TACACAGCCA
2221 GTCTGCAGGT CGACCATAGT GACTGGATAT GTTGTGTTTT ACAGTATTAT GTAGTCTGTT
2281 TTTTATGCAA AATCTAATTT AATATATTGA TATTTATATC ATTTTACGTT TCTCGTTCAG
2341 CTTTCTTGTA CAAAGTGGTT GATATCGAAT TCCTGCAGCC CGGGGGATCC ACTAGTTCTA
2401 GAGCACTGCG ATGAGTGGCA GGGCGGGGCG TAATTTTTTT AAGGCAGTTA TTGGTGCCCT
2461 TAAACGCCTG GTGCTACGCC TGAATAAGTG ATAATAAGCG GATGAATGGC AGAAATTCGC
2521 CGGATCTTTG TGAAGGAACC TTACTTCTGT GGTGTGACAT AATTGGACAA ACTACCTACA-

FIGURE 31B

5941 CAACTCGGTC GCCGCATACA CTATTCTCAG AATGACTTGG TTGAGTACTC ACCAGTCACA
6001 GAAAAGCATC TTACGGATGG CATGACAGTA AGAGAATTAT GCAGTGCTGC CATAACCATG
6061 AGTGATAACA CTGCGGCCAA CTTACTTCTG ACAACGATCG GAGGACCGAA GGAGCTAACC
6121 GCTTTTTTGC ACAACATGGG GGATCATGTA ACTCGCCTTG ATCGTTGGGA ACCGGAGCTG
6181 AATGAAGCCA TACCAAACGA CGAGCGTGAC ACCACGATGC CTGTAGCAAT GGCAACAACG
6241 TTGCGCAAAC TATTAACCTG CGAACTACTT ACTCTAGCTT CCCGGCAACA ATTAATAGAC
6301 TGGATGGAGG CGGATAAAGT TGCAGGACCA CTTCTGCGCT CGGCCCTTCC GGCTGGCTGG
6361 TTTATTGCTG ATAAATCTGG AGCCGGTGAG CGTGGGTCTC GCGGTATCAT TGCAGCACTG
6421 GGGCCAGATG GTAAGCCCTC CCGTATCGTA GTTATCTACA CGACGGGGAG TCAGGCAACT
6481 ATGGATGAAC GAAATAGACA GATCGCTGAG ATAGGTGCCT CACTGATTAA GCATTGGTAA
6541 CTGTCAGACC AAGTTTACTC ATATATACTT TAGATTGATT TAAAACTTCA TTTTAAATTT
6601 AAAAGGATCT AGGTGAAGAT CCTTTTTGAT AATCTCATGA CCAAAATCCC TTAACGTGAG
6661 TTTTCGTTCC ACTGAGCGTC AGACCCCGTA GAAAAGATCA AAGGATCTTC TTGAGATCCT
6721 TTTTTTCTGC GCGTAATCTG CTGCTTGCAA ACAAAAAAAC CACCGCTACC AGCGGTGGTT
6781 TGTTTGCCGG ATCAAGAGCT ACCAACTCTT TTTCCGAAGG TAACTGGCTT CAGCAGAGCG
6841 CAGATACCAA ATACTGTCCT TCTAGTGTAG CCGTAGTTAG GCCACCACTT CAAGAACTCT
6901 GTAGCACCGC CTACATACCT CGCTCTGCTA ATCCTGTTAC CAGTGGCTGC TGCCAGTGGC
6961 GATAAGTCGT GTCTTACCGG GTTGGA CTCA AGACGATAGT TACCGGATAA GGCGCAGCGG
7021 TCGGGCTGAA CGGGGGGTTC GTGCACACAG CCCAGCTTGG AGCGAACGAC CTACACCGAA
7081 CTGAGATACC TACAGCGTGA GCATTGAGAA AGCGCCACGC TTCCCGAAGG GAGAAAGGCG
7141 GACAGGTATC CGGTAAGCGG CAGGGTCGGA ACAGGAGAGC GCACGAGGGA GCTTCCAGGG
7201 GGAAACGCCT GGTATCTTTA TAGTCCTGTC GGGTTTCGCC ACCTCTGACT TGAGCGTCTGA
7261 TTTTGTGAT GCTCGTCA

FIGURE 32D

Figure 33A:

pDEST13

Native protein in E. coli: λ PL promoter

3721 tgggcaaacc aagacagcta aagatctctc acctaccaaa caatgcccc ctgcaaaaaa
 acccgtttgg ttctgtcgat ttctagagag tggatggttt gttacggggg gacgtttttt

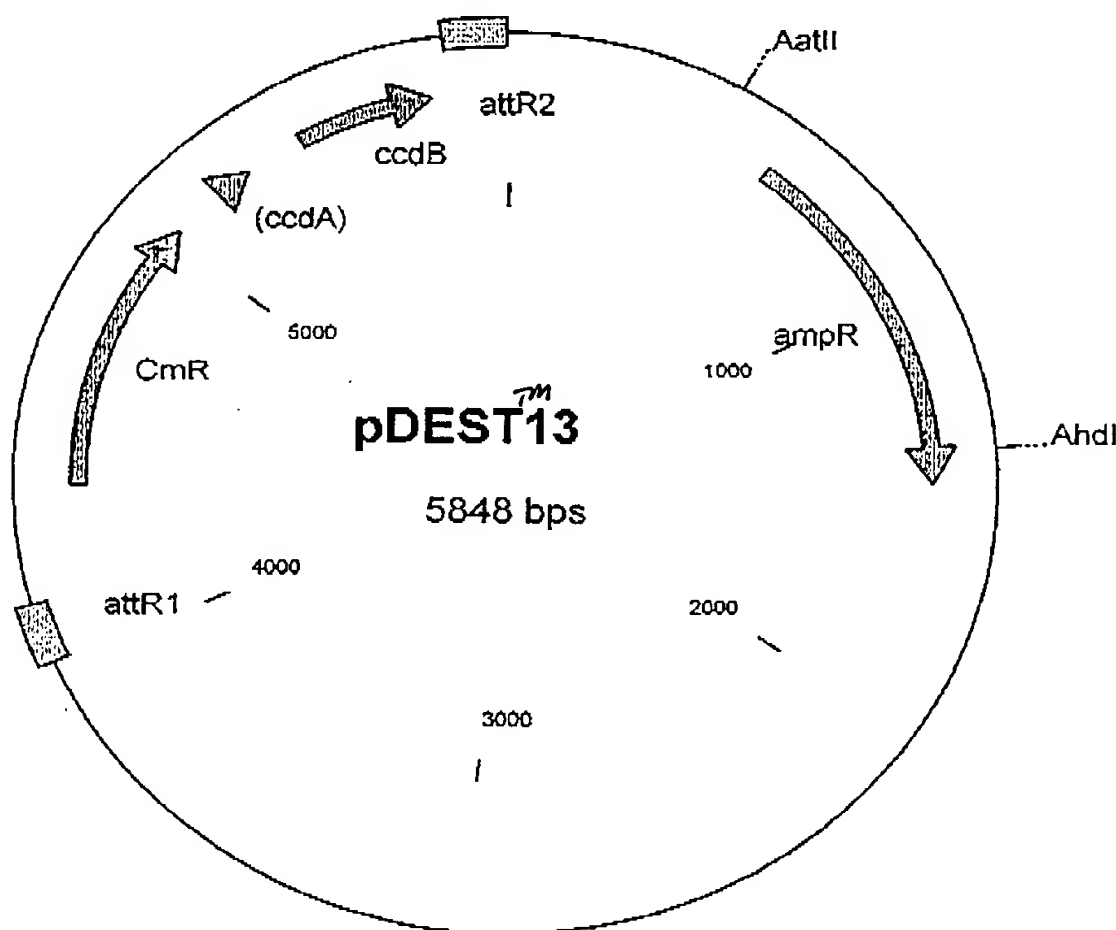
3781 taaattcata taaaaaacat acagataacc atctgcggtg ataaattatc tctggcggtg
 atttaagtat attttttgta tgtctattgg tagacgccac tatttaatag agaccgccac

3841 ttgacataaa taccactggc ggtgatactg agcacatcag caggacgcac tgaccaccat
aactgtattt atggtgaccg ccactatgac tctgttagtc gtcctgcgtg actggtggta

3901 gaaggtgacg ctcttaaaaa ttaagecctg aagaaggcca gcattcaaag cagaaggctt
 cttccactgc gagaattttt aattcgggac ttcttcccgt cgtaagtttc gtcttccgaa

3961 tgggggtgtgt gatacgaaac gaagcattgg gatcatcaca agtttgtaca aaaaagctga
 accccacaca ctatgctttg cttcgtaacc ctagtagtgt tcaaacaatgt tttttcgact

BglII
EcoNI
attR1
attR2
Int



pDEST13 5848 bp

Location (Base Nos.)	Gene Encoded
599..1458	ampR
4123..3998	attR1
4372..5031	CmR
5151..5235	inactivated ccdA
5373..5678	ccdB
5719..5843	attR2

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1  TTCACTGGCC GTCGTTTTAC AACGTCGTGA CTGGGAAAAC CCTGGCGTTA CCCAACTTAA
61  TCGCCTTGCA GCACATCCCC CTTTCGCCAG CTGGCGTAAT AGCGAAGAGG CCCGCACCGA
121 TCGCCCTTCC CAACAGTTGC GCAGCCTGAA TGGCGAATGG CGCCTGATGC GGTATTTTCT
181 CCTTACGCAT CTGTGCGGTA TTTACACCCG CATATGGTGC ACTCTCAGTA CAATCTGCTC
241 TGATGCCGCA TAGTTAAGCC AGCCCCGACA CCCGCCAACA CCCGCTGACG CGCCCTGACG
301 GGCTTGTCTG CTCCCGGCAT CCGCTTACAG ACAAGCTGTG ACCGTCTCCG GGAGCTGCAT
361 GTGTCAGAGG TTTTCACCGT CATCACCGAA ACGCGCGAGA CGAAAGGGCC TCGTGATACG
421 CCTATTTTTA TAGGTTAATG TCATGATAAT AATGGTTTCT TAGACGTCAG GTGGCACTTT
481 TCGGGGAAAT GTGCGCGGAA CCCCTATTTG TTTATTTTTT TAAATACATT CAAATATGTA
541 TCCGCTCATG AGACAATAAC CCTGATAAAT GCTTCAATAA TATTGAAAAA GGAAGAGTAT
601 GAGTATTCAA CATTTCCGTG TCGCCCTTAT TCCCTTTTTT GCGGCATTTT GCCTTCCTGT
661 TTTTGCTCAC CCAGAAACGC TGGTGAAAGT AAAAGATGCT GAAGATCAGT TGGGTGCACG
721 AGTGGGTAC ATCGAACTGG ATCTCAACAG CGGTAAGATC CTTGAGAGTT TTCGCCCCGA
781 AGAACGTTTT CCAATGATGA GCACTTTTAA AGTTCTGCTA TGTGGCGCGG TATTATCCCG
841 TATTGACGCC GGGCAAGAGC AACTCGGTCG CCGCATACAC TATTCTCAGA ATGACTTGGT
901 TGAGTACTCA CCAGTCACAG AAAAGCATCT TACGGATGGC ATGACAGTAA GAGAATTATG
961 CAGTGCTGCC ATAACCATGA GTGATAACAC TGCGGCCAAC TTA CTCTGA CAACGATCGG
1021 AGGACCGAAG GAGCTAACCG CTTTTTTGCA CAACATGGGG GATCATGTAA CTCGCCTTGA
1081 TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA CCACGATGCC
1141 TG TAGCAATG GCAACAACGT TGC GCAA ACT ATTA ACTGGC GA ACTACTTA CTCTAGCTTC
1201 CCGGCAACAA TTAATAGACT GGATGGAGGC GGATAAAGTT GCAGGACCAC TTCTGCGCTC
1261 GGCCCTTCCG GCTGGCTGGT TTATTGCTGA TAAATCTGGA GCCGGTGAGC GTGGGTCTCG
1321 CGGTATCATT GCAGCACTGG GGCCAGATGG TAAGCCCTCC CGTATCGTAG TTATCTACAC
1381 GACGGGGAGT CAGGCAACTA TGGATGAACG AAATAGACAG ATCGCTGAGA TAGGTGCCTC
1441 ACTGATTAAG CATTGGTAAC TGTCAGACCA AGTTTACTCA TATATACTTT AGATTGATTT
1501 AAAACTTCAT TTTTAATTTA AAAGGATCTA GGTGAAGATC CTTTTTGATA ATCTCATGAC
1561 CAAAATCCCT TAACGTGAGT TTTCGTTCCA CTGAGCGTCA GACCCCGTAG AAAAGATCAA
1621 AGGATCTTCT TGAGATCCTT TTTTCTGCG CGTAATCTGC TGCTTGCAA CAAAAAACC
1681 ACCGCTACCA GCGGTGGTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT TTCCGAAGGT
1741 AACTGGCTTC AGCAGAGCGC AGATACCAA TACTGTTCTT CTAGTGTAGC CGTAGTTAGG
1801 CCACCACTTC AAGAACTCTG TAGCACC GCC TACATACCTC GCTCTGCTAA TCCTGTTACC
1861 AGTGGCTGCT GCCAGTGGCG ATAAGTCGTG TCTTACCGGG TTGGACTCAA GACGATAGTT
1921 ACCGGATAAG GCGCAGCGGT CGGGCTGAAC GGGGGGTT CG TGCACACAGC CCAGCTTGGA
1981 GCGAACGACC TACACCGAAC TGAGATACCT ACAGCGTGAG CATTGAGAAA GCGCCACGCT
2041 TCCCGAAGGG AGAAAGGCGG ACAGGTATCC GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG
2101 CACGAGGGAG CTTCCAGGGG GAAACGCCTG GTATCTTTAT AGTCCTGT CG GGTTCGCCA
2161 CCTCTGACTT GAGCGTCGAT TTTTGTGATG CTCGTCAGGG GGGCGGAGCC TATGGAAAAA
2221 CGCCAGCAAC GCGGCCTTTT TACGGTTCCT GGCCTTTTGC TGGCCTTTTG CTCACATGTT
2281 CTTTCCTGCG TTATCCCTTG ATTCTGTGGA TAACCGTATT ACCGCCTTTG AGTGAGCTGA
2341 TACCGCTCGC CGCAGCCGAA CGACCGAGCG CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA
2401 GCGCCCAATA CGCAAACCGC CTCTCCCCGC GCGTTGGCCG ATTCATTAAT GCAGCTGGCA
2461 CGACAGGTTT CCCGACTGGA AAGCGGGCAG TGAGCGCAAC GCAATTAATG TGAGTTAGCT
2521 CACTCATTAG GCACCC CAGG CTTTACACTT TATGCTTCCG GCTCGTATGT TGTGTGGAAT
2581 TGTGAGCGGA TAACAATTTT ACACAGGAAA CAGCTATGAC CATGATTACG CCAAGCTTGG
2641 CTGCAGGTGA TGATTATCAG CCAGCAGAGA TTAAGGAAAA CAGACAGGTT TATTGAGCGC
2701 TTATCTTTCC CTTTATTTTT GCTGCGGTAA GTCGCATAAA AACCATTCTT CATAATTCAA-

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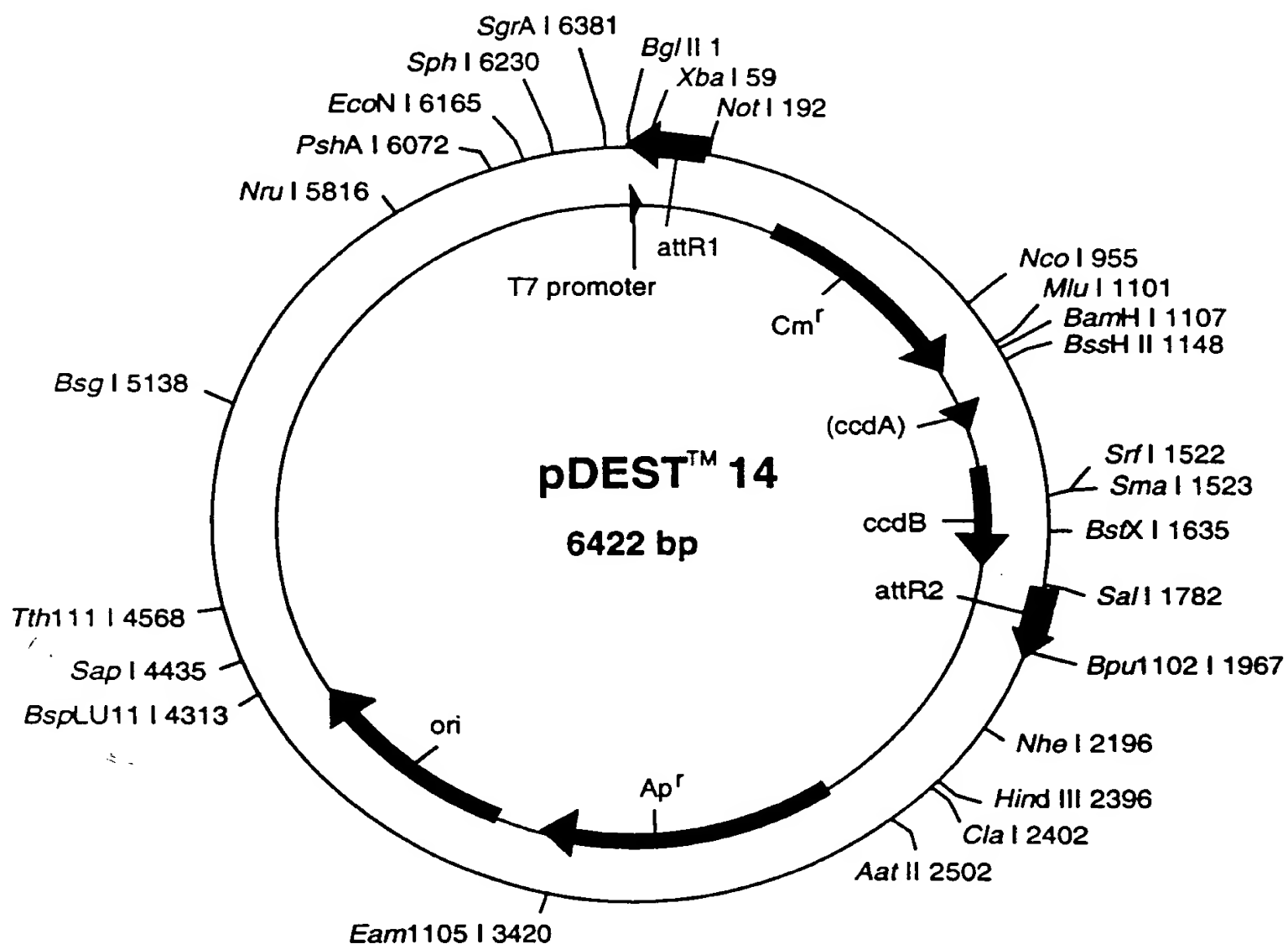
FIGURE 33B

2761	TCCATTTACT	ATGTTATGTT	CTGAGGGGAG	TGAAAATTCC	CCTAATTCTGA	TGAAGATTCT
2821	TGCTCAATTG	TTATCAGCTA	TGCGCCGACC	AGAACACCTT	GCCGATCAGC	CAAACGTCTC
2881	TTCAGGCCAC	TGACTAGCGA	TAAC TTCCC	CACAACGGAA	CAACTCTCAT	TGCATGGGAT
2941	CATTGGGTAC	TGTGGGTTTA	GTGGTTGTAA	AAACACCTGA	CCGCTATCCC	TGATCAGTTT
3001	CTTGAAGGTA	AACTCATCAC	CCCCAAGTCT	GGCTATGCAG	AAATCACCTG	GCTCAACAGC
3061	CTGCTCAGGG	TCAACGAGAA	TTAACATTCC	GTCAGGAAAG	CTTGGCTTGG	AGCCTGTTGG
3121	TGCGGTCATG	GAATTACCTT	CAACCTCAAG	CCAGAATGCA	GAATCACTGG	CTTTTTTGGT
3181	TGTGCTTACC	CATCTCTCCG	CATCACCTTT	GGTAAAGGTT	CTAAGCTTAG	GTGAGAACAT
3241	CCCTGCCTGA	ACATGAGAAA	AAACAGGGTA	CTCATACTCA	CTTCTAAGTG	ACGGCTGCAT
3301	ACTAACCCTG	TCATACATCT	CGTAGATTTT	TCTGGCGATT	GAAGGGCTAA	ATTCTTCAAC
3361	GCTAACTTTG	AGAATTTTTG	CAAGCAATGC	GGCGTTATAA	GCATTTAATG	CATTGATGCC
3421	ATTAAATAAA	GCACCAACGC	CTGACTGCCC	CATCCCCATC	TTGTCTGCGA	CAGATTCCCTG
3481	GGATAAGCCA	AGTTCATTTT	TCTTTTTTTT	ATAAATTGCT	TTAAGGCGAC	GTGCGTCCTC
3541	AAGCTGCTCT	TGTGTTAATG	GTTTCTTTTT	TGTGCTCATA	CGTTAAATCT	ATCACCGCAA
3601	GGGATAAATA	TCTAACACCG	TGCGTGTTGA	CTATTTTACC	TCTGGCGGTG	ATAATGGTTG
3661	CATGTACTAA	GGAGGTTGTA	TGGAACAACG	CATAACCCTG	AAAGATTATG	CAATGCGCTT
3721	TGGGCAAACC	AAGACAGCTA	AAGATCTCTC	ACCTACCAA	CAATGCCCCC	CTGCAAAAA
3781	TAAATTCATA	TAAAAAACAT	ACAGATAACC	ATCTGCGGTG	ATAAATTATC	TCTGGCGGTG
3841	TTGACATAAA	TACCACTGGC	GGTGATACTG	AGCACATCAG	CAGGACGCAC	TGACCACCAT
3901	GAAGGTGACG	CTCTTAAAAA	TTAAGCCCTG	AAGAAGGGCA	GCATTCAAAG	CAGAAGGCTT
3961	TGGGGTGTGT	GATACGAAAC	GAAGCATTGG	GATCATCACA	AGTTTGTACA	AAAAAGCTGA
4021	ACGAGAAACG	TAAAATGATA	TAAATATCAA	TATATTAAAT	TAGATTTTGC	ATAAAAACA
4081	GACTACATAA	TACTGTAAAA	CACAACATAT	CCAGTCACTA	TGGCGGCCGC	TAAGTTGGCA
4141	GCATCACCCG	ACGCACTTTG	CGCCGAATAA	ATACCTGTGA	CGGAAGATCA	CTTCGCAGAA
4201	TAAATAAATC	CTGGTGTCCC	TGTTGATACC	GGGAAGCCCT	GGGCCAACTT	TTGGCGAAAA
4261	TGAGACGTTG	ATCGGCACGT	AAGAGGTTCC	AACTTTCACC	ATAATGAAAT	AAGATCACTA
4321	CCGGGCGTAT	TTTTTGAGTT	ATCGAGATTT	TCAGGAGCTA	AGGAAGCTAA	AATGGAGAAA
4381	AAAATCACTG	GATATAACCAC	CGTTGATATA	TCCCAATGGC	ATCGTAAAGA	ACATTTTGAG
4441	GCATTTTCAGT	CAGTTGCTCA	ATGTACCTAT	AACCAGACCG	TTCAGCTGGA	TATTACGGCC
4501	TTTTTTAAAGA	CCGTAAAGAA	AAATAAGCAC	AAGTTTTATC	CGGCCTTTAT	TCACATTCTT
4561	GCCCGCCTGA	TGAATGCTCA	TCCGGAATTC	CGTATGGCAA	TGAAAGACGG	TGAGCTGGTG
4621	ATATGGGATA	GTGTTCACCC	TTGTTACACC	GTTTTCCATG	AGCAAACCTGA	AACGTTTTCA
4681	TCGCTCTGGA	GTGAATACCA	CGACGATTTT	CGGCAGTTTC	TACACATATA	TTCGCAAGAT
4741	GTGGCGTGTT	ACGGTGAAAA	CCTGGCCTAT	TTCCCTAAAG	GGTTTATTGA	GAATATGTTT
4801	TTCTGTCTCAG	CCAATCCCTG	GGTGAGTTTC	ACCAGTTTTG	ATTTAAACGT	GGCCAATATG
4861	GACAACCTTCT	TCGCCCCCGT	TTTCACCATG	GGCAAATATT	ATACGCAAGG	CGACAAGGTG
4921	CTGATGCCGC	TGGCGATTCA	GGTTCATCAT	GCCGTCTGTG	ATGGCTTCCA	TGTCGGCAGA
4981	ATGCTTAATG	AATTACAACA	GTACTGCGAT	GAGTGGCAGG	GCGGGGCGTA	AACGCGTGGA
5041	TCCGGCTTAC	TAAAAGCCAG	ATAACAGTAT	GCGTATTTGC	GCGCTGATTT	TTGCGGTATA
5101	AGAATATATA	CTGATATGTA	TACCCGAAGT	ATGTCAAAAA	GAGGTGTGCT	ATGAAGCAGC
5161	GTATTACAGT	GACAGTTGAC	AGCGACAGCT	ATCAGTTGCT	CAAGGCATAT	ATGATGTCAA
5221	TATCTCCGGT	CTGGTAAGCA	CAACCATGCA	GAATGAAGCC	CGTCGTCTGC	GTGCCGAACG
5281	CTGGAAAGCG	GAAAATCAGG	AAGGGATGGC	TGAGGTCGCC	CGGTTTATTG	AAATGAACGG
5341	CTCTTTTGCT	GACGAGAACA	GGGACTGGTG	AAATGCAGTT	TAAGGTTTAC	ACCTATAAAA
5401	GAGAGAGCCG	TTATCGTCTG	TTTGTGGATG	TACAGAGTGA	TATTATTGAC	ACGCCCGGGC
5461	GACGGATGGT	GATCCCCCTG	GCCAGTGCAC	GTCTGCTGTC	AGATAAAGTC	TCCCGTGAAC
5521	TTTACCCGGT	GGTGCATATC	GGGGATGAAA	GCTGGCGCAT	GATGACCACC	GATATGGCCA
5581	GTGTGCCGGT	CTCCGTTATC	GGGGAAGAAG	TGGCTGATCT	CAGCCACCGC	GAAAATGACA
5641	TCAAAAACGC	CATTAACCTG	ATGTTCTGGG	GAATATAAAT	GTCAGGCTCC	GTTATACACA
5701	GCCAGTCTGC	AGGTGACCA	TAGTGACTGG	ATATGTTGTG	TTTTACAGTA	TTATGTAGTC
5761	TGTTTTTTTAT	GCAAAATCTA	ATTTAATATA	TTGATATTTA	TATCATTTTA	CGTTTCTCGT
5821	TCAGCTTTCT	TGTACAAAGT	GGTGATAA			

FIGURE 33C

Figure 34A: pDEST14 Native Protein Expression in *E. coli*, T7 Promoter

3961 tgccggccac gatgcgtecg gcgtagagga tcgagatctc gatcccgcgga aattaatacgc
 acggccggtg ctacgcaggc cgcattctcct agctctagag ctagggcgct ttaattatgc
 //-----mRNA-----
 4021 //-----2-----
 actcactata gggagaccac aacggtttcc ctctagatca caagtttgtta caaaaaagct
 //-----XbaI-----
 tgagtgatat ccctctggtg ttgccaaagg gagatctagt gttcaaacaat gttttttcga
 //-----EcoRI-----



pDEST14 6422 bp (rotated to position 4000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
185..61	attR1
435..1094	CmR
1214..1298	inactivated ccdA
1436..1741	ccdB
1782..1906	attR2
2632..3489	ampR

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1  CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGATC
61  ACAAGTTTGT AAAAAAAGC TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA
121 AATTAGATTT TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA
181 CTATGGCGGC CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG
241 TGACGGAAGA TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC
301 CCTGGGCCAA CTTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAAC TTTC
361 ACCATAATGA AATAAGATCA CTACCGGGCG TATTTTTTTGA GTTATCGAGA TTTTCAGGAG
421 CTAAGGAAGC TAAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT
481 GGCATCGTAA AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA
541 CCGTTCAGCT GGATATTACG GCCTTTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT
601 ATCCGGCCTT TATTCACATT CTTGCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG
661 CAATGAAAGA CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC
721 ATGAGCAAAC TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT
781 TTCTACACAT ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA
841 AAGGGTTTAT TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGTT
901 TTGATTTAAA CGTGGCCAAT ATGGACAAC TCTTCGCCCC CGTTTTTCACC ATGGGCAAAT
961 ATTATACGCA AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTCA CATGCCGTCT
1021 GTGATGGCTT CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC
1081 AGGGCGGGGC GTAAACGCGT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT
1141 TGCGCGCTGA TTTTTCGGGT ATAAGAATAT AACTGATAT GTATACCCGA AGTATGTCAA
1201 AAAGAGGTGT GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT
1261 GCTCAAGGCA TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA
1321 GCGCGTCGTC TGCGTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC
1381 GCGCGGTTTA TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA
1441 GTTTAAGGTT TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG
1501 TGATATTATT GACACGCCCC GCGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT
1561 GTCAGATAAA GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG
1621 CATGATGACC ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA
1681 TCTCAGCCAC CGCGAAAATG ACATCAAAAA CGCCATTAAC CTGATGTTCT GGGGAATATA
1741 AATGTCAGGC TCCCTTATAC ACAGCCAGTC TGCAGGTCGA CCATAGTGAC TGGATATGTT
1801 GTGTTTTTACA GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT ATATTGATAT
1861 TTATATCATT TTACGTTTCT CGTTCAGCTT TCTTGTAACA AGTGGTGATG ATCCGGCTGC
1921 TAACAAAGCC CGAAAGGAAG CTGAGTTGGC TGCTGCCACC GCTGAGCAAT AACTAGCATA
1981 ACCCCTTGGG GCCTCTAAAC GGGTCTTGAG GGGTTTTTTG CTGAAAGGAG GAACTATATC
2041 CGGATATCCA CAGGACGGGT GTGGTCGCCA TGATCGCGTA GTCGATAGTG GCTCCAAGTA
2101 GCGAAGCGAG CAGGACTGGG CGGCGGCCAA AGCGGTCGGA CAGTGCTCCG AGAACGGGTG
2161 CGCATAGAAA TTGCATCAAC GCATATAGCG CTAGCAGCAC GCCATAGTGA CTGGCGATGC
2221 TGTCGGAATG GACGATATCC CGCAAGAGGC CCGGCAGTAC CGGCATAACC AAGCCTATGC
2281 CTACAGCATC CAGGGTGACG GTGCCGAGGA TGACGATGAG CGCATTGTTA GATTTTCATC
2341 ACGGTGCCTG ACTGCGTTAG CAATTTAACT GTGATAAACT ACCGCATTAA AGCTTATCGA
2401 TGATAAGCTG TCAAACATGA GAATTCTTGA AGACGAAAGG GCCTCGTGAT ACGCCTATTT
2461 TTATAGGTTA ATGTCATGAT AATAATGGTT TCTTAGACGT CAGGTGGCAC TTTTCGGGGA
2521 AATGTGCGCG GAACCCCTAT TTGTTTATTT TTCTAAATAC ATTCAAATAT GTATCCGCTC
2581 ATGAGACAAT AACCTTGATA AATGCTTCAA TAATATTGAA AAAGGAAGAG TATGAGTATT
2641 CAACATTTCC GTGTCGCCCT TATTCCTTTT TTTGCGGCAT TTTGCCTTCC TGTTTTTGCT
2701 CACCCAGAAA CGCTGGTGAA AGTAAAAGAT GCTGAAGATC AGTTGGGTGC ACGAGTGGGT-

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Figure 34B

2761 TACATCGAAC TGGATCTCAA CAGCGGTAAG ATCCTTGAGA GTTTTCGCCC CGAAGAACGT
2821 TTTCCAATGA TGAGCACTTT TAAAGTTCTG CTATGTGGCG CGGTATTATC CCGTGTTGAC
2881 GCCGGGCAAG AGCAACTCGG TCGCCGCATA CACTATTCTC AGAATGACTT GGTTGAGTAC
2941 TCACCAGTCA CAGAAAAGCA TCTTACGGAT GGCATGACAG TAAGAGAATT ATGCAGTGCT
3001 GCCATAACCA TGAGTGATAA CACTGCGGCC AACTTACTTC TGACAACGAT CGGAGGACCG
3061 AAGGAGCTAA CCGCTTTTTT GCACAACATG GGGGATCATG TAACTCGCCT TGATCGTTGG
3121 GAACCGGAGC TGAATGAAGC CATACCAAAC GACGAGCGTG ACACCACGAT GCCTGCAGCA
3181 ATGGCAACAA CGTTGCGCAA ACTATTAAC TGGCGAAGTAC TTACTCTAGC TTCCCGGCAA
3241 CAATTAATAG ACTGGATGGA GGCGGATAAA GTTGACAGGAC CACTTCTGCG CTCGGCCCTT
3301 CCGGCTGGCT GGTATTATTG TGATAAATCT GGAGCCGGTG AGCGTGGGTC TCGCGGTATC
3361 ATTGCAGCAC TGGGGCCAGA TGGTAAGCCC TCCCGTATCG TAGTTATCTA CACGACGGGG
3421 AGTCAGGCAA CTATGGATGA ACGAAATAGA CAGATCGCTG AGATAGGTGC CTCACTGATT
3481 AAGCATTGGT AACTGTCAGA CCAAGTTTAC TCATATATAC TTTAGATTGA TTTAAAACTT
3541 CATTTTTAAT TTAAAAGGAT CTAGGTGAAG ATCCTTTTTG ATAATCTCAT GACCAAAATC
3601 CCTTAACGTG AGTTTTTCGT CCACTGAGCG TCAGACCCCG TAGAAAAGAT CAAAGGATCT
3661 TCTTGAGATC CTTTTTTTCT GCGCGTAATC TGCTGCTTGC AAACAAAAAA ACCACCGCTA
3721 CCAGCGGTGG TTTGTTTGCC GGATCAAGAG CTACCAACTC TTTTTCGGAA GGTAAGTGGC
3781 TTCAGCAGAG CGCAGATACC AAATACTGTC CTTCTAGTGT AGCCGTAGTT AGGCCACCAC
3841 TTCAAGAACT CTGTAGCACC GCCTACATAC CTCGCTCTGC TAATCCTGTT ACCAGTGGCT
3901 GCTGCCAGTG GCGATAAGTC GTGTCTTACC GGGTTGGACT CAAGACGATA GTTACCGGAT
3961 AAGGCGCAGC GGTGCGGCTG AACGGGGGGT TCGTGACAC AGCCCAGCTT GGAGCGAACG
4021 ACCTACACCG AACTGAGATA CCTACAGCGT GAGCTATGAG AAAGCGCCAC GCTTCCCGAA
4081 GGGAGAAAGG CGGACAGGTA TCCGGTAAGC GGCAGGGTCG GAACAGGAGA GCGCACGAGG
4141 GAGCTTCCAG GGGGAAACGC CTGGTATCTT TATAGTCCTG TCGGGTTTCG CCACCTCTGA
4201 CTTGAGCGTC GATTTTTGTG ATGCTCGTCA GGGGGGCGGA GCCTATGGAA AAACGCCAGC
4261 AACGCGGCCT TTTTACGGTT CCTGGCCTTT TGCTGGCCTT TTGCTCACAT GTTCTTTCTT
4321 GCGTTATCCC CTGATTCTGT GGATAACCGT ATTACCGCCT TTGAGTGAGC TGATACCGCT
4381 CGCCGCAGCC GAACGACCGA GCGCAGCGAG TCAGTGAGCG AGGAAAGCGA AGAGCGCCTG
4441 ATGCGGTATT TTCTCCTTAC GCATCTGTGC GGTATTTTAC ACCGCATATA TGGTGCACCTC
4501 TCAGTACAAT CTGCTCTGAT GCCGCATAGT TAAGCCAGTA TAACTCCGC TATCGCTACG
4561 TGAAGTGGTC ATGGCTGCGC CCCGACACCC GCCAACACCC GCTGACGCGC CCTGACGGGC
4621 TTGTCTGCTC CCGGCATCCG CTTACAGACA AGCTGTGACC GTCTCCGGGA GCTGCATGTG
4681 TCAGAGGTTT TCACCGTCAT CACCGAAACG CGCGAGGCAG CTGCGGTAAA GCTCATCAGC
4741 GTGGTCGTGA AGCGATTAC AGATGTCTGC CTGTTCATCC GCGTCCAGCT CGTTGAGTTT
4801 CTCCAGAAGC GTTAATGTCT GGCTTCTGAT AAAGCGGGCC ATGTTAAGGG CGGTTTTTTC
4861 CTGTTTGGTC ACTGATGCCT CCGTGTAAGG GGGATTTCTG TTCATGGGGG TAATGATACC
4921 GATGAAACGA GAGAGGATGC TCACGATACG GGTACTGAT GATGAACATG CCCGGTTACT
4981 GGAACGTTGT GAGGGTAAAC AACTGGCGGT ATGGATGCGG CGGGACCAGA GAAAAATCAC
5041 TCAGGGTCAA TGCCAGCGCT TCGTTAATAC AGATGTAGGT GTTCCACAGG GTAGCCAGCA
5101 GCATCCTGCG ATGCAGATCC GGAACATAAT GGTGCAGGGC GCTGACTTCC GCGTTTCCAG
5161 ACTTTACGAA ACACGGAAAC CGAAGACCAT TCATGTTGTT GCTCAGGTCG CAGACGTTTT
5221 GCAGCAGCAG TCGCTTCACG TTCGCTCGCG TATCGGTGAT TCATTCTGCT AACCAGTAAG
5281 GCAACCCCGC CAGCCTAGCC GGGTCCTCAA CGACAGGAGC ACGATCATGC GCACCCGTGG
5341 CCAGGACCCA ACGCTGCCCG AGATGCGCCG CGTGCGGCTG CTGGAGATGG CGGACGCGAT
5401 GGATATGTTT TGCCAAGGGT TGGTTTGCGC ATTCACAGTT CTCCGCAAGA ATTGATTGGC
5461 TCCAATTCTT GGAGTGGTGA ATCCGTTAGC GAGGTGCCGC CGGCTTCCAT TCAGGTGCGAG
5521 GTGGCCCCGGC TCCATGCACC GCGACGCAAC GCGGGGAGGC AGACAAGGTA TAGGGCGGGC
5581 CCTACAATCC ATGCCAACCC GTTCCATGTG CTCGCCGAGG CGGCATAAAT CGCCGTGACG
5641 ATCAGCGGTC CAGTGATCGA AGTTAGGCTG GTAAGAGCCG CGAGCGATCC TTGAAGCTGT
5701 CCCTGATGGT CGTCATCTAC CTGCCTGGAC AGCATGGCCT GCAACGCGGG CATCCCGATG
5761 CCGCCGGAAG CGAGAAGAAT CATAATGGGG AAGGCCATCC AGCCTCGCGT CGCGAACGCC
5821 AGCAAGACGT AGCCCAGCGC GTCGGCCGCC ATGCCGGCGA TAATGGCCTG CTTCTCGCCG
5881 AAACGTTTGG TGGCGGGACC AGTGACGAAG GCTTGAGCGA GGGCGTGCAA GATTCCGAAT
5941 ACCGCAAGCG ACAGGCCGAT CATCGTCGCG CTCCAGCGAA AGCGGTCTCT GCCGAAAATG
6001 ACCCAGAGCG CTGCCGGCAC CTGTCCTACG AGTTGCATGA TAAAGAAGAC AGTCATAAGT
6061 GCGGCGACGA TAGTCATGCC CCGCGCCAC CGGAAGGAGC TGAAGGGTT GAAGGCTCTC
6121 AAGGGCATCG GTCGATCGAC GCTCTCCCTT ATGCGACTCC TGCATTAGGA AGCAGCCAG
6181 TAGTAGGTTG AGGCCGTTGA GCACCGCCGC CGCAAGGAAT GGTGCATGCA AGGAGATGGC-

Figure 34C

6241 GCCCAACAGT CCCCCGGCCA CGGGGCCTGC CACCATACCC ACGCCGAAAC AAGCGTCAT
6301 GAGCCCGAAG TGGCGAGCCC GATCTTCCCC ATCGGTGATG TCGGCGATAT AGGCGCCAGC
6361 AACCGCACCT GTGGCGCCGG TGATGCCGGC CACGATGCGT CCGGCGTAGA GGATCGAGAT
6421 CT

6241 6301 6361 6421

FIGURE 34D

Figure 35A: pDEST15 Glutathione-S-transferase Fusion in *E. coli*, T7 Promoter

T7 Promoter mRNA

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1  nat cga gat ctc gat ccc gcg aaa tta ata cga ctc act ata ggg aga cca
   nta gct cta gag cta ggg cgc ttt aat tat gct gag tga tat ccc tct ggt

52  caa cgg ttt ccc tct aga aat aat ttt gtt taa ctt taa gaa gga gat ata
   gtt gcc aaa ggg aga tct tta tta aaa caa att gaa att ctt cct cta tat

103 cat atg ttc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg caa ccc
   gta tac agg gga tat gat cca ata acc ttt taa ttc ccg gaa cac gtt ggg
      Start Translation GST

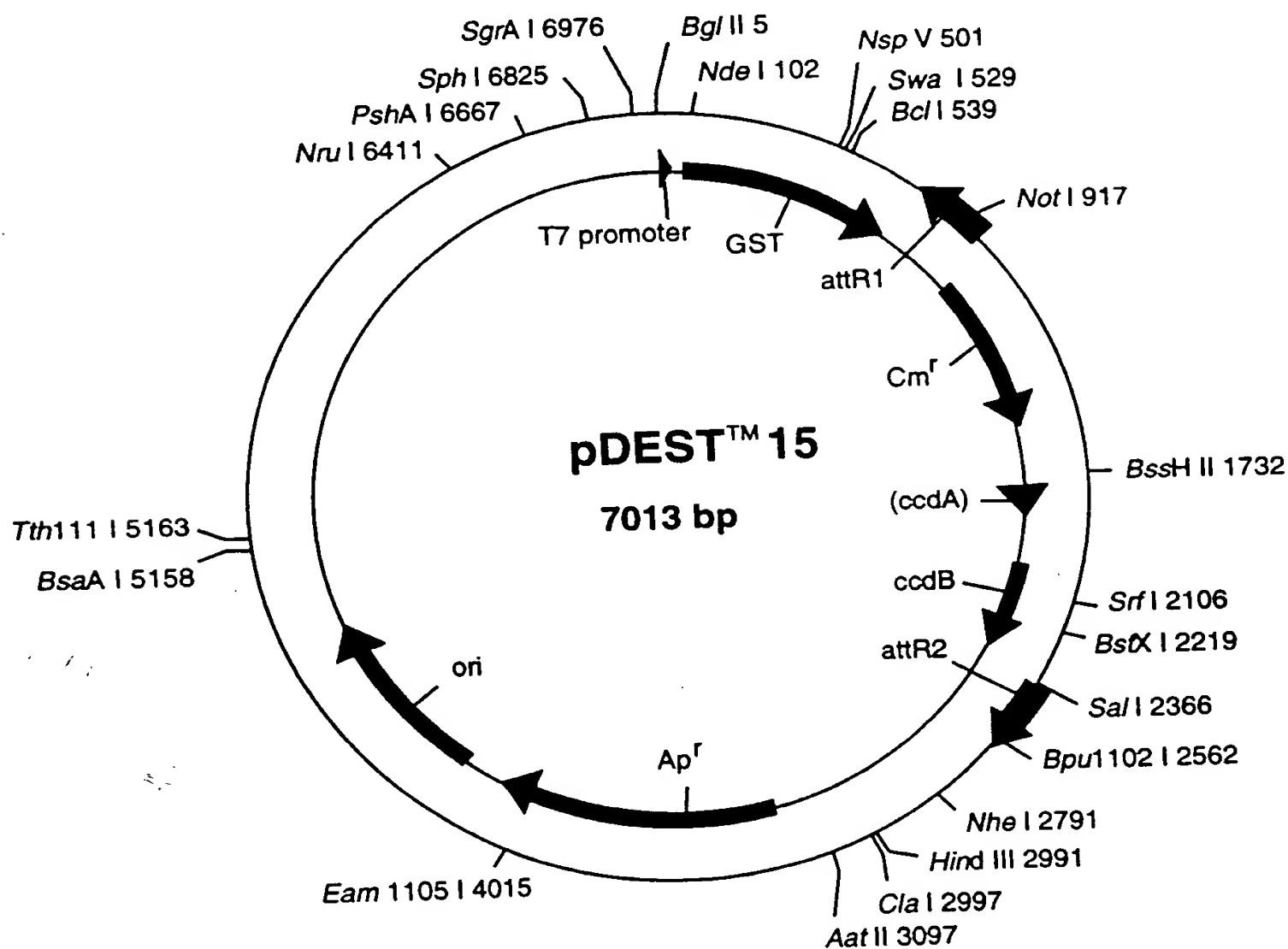
154 act cga ctt ctt ttg gaa tat ctt gaa gaa aaa tat gaa gag cat ttg tat
   tga gct gaa gaa aac ctt ata gaa ctt ctt ttt ata ctt ctc gta aac ata

715 cag ggc tgg caa gcc acg ttt ggt ggt ggc gac cat cct cca aaa tcg gat
   gtc ccg acc gtt cgg tgc aaa cca cca ccg ctg gta gga ggt ttt agc cta

766 ctg gtt ccg cgt cca tgg tgc aat caa aca agt tgg tac aaa aaa gct gaa
   gac caa ggc gca ggt acc agc tta gtt tgt tca aac atg ttt ttt cga ctt

817 cga gaa acg taa aat gat ata aat atc aat ata tta aat tag att ttg cat
   gct ctt tgc att tta cta tat tta tag tta tat aat tta atc taa aac gta
  
```

Handwritten annotations:
 - Above line 52: XbaI site (tct aga aat aat ttt)
 - Above line 103: NdeI site (cat atg ttc)
 - Above line 766: T S L Y K K A (aca agt tgg tac aaa aaa)
 - Above line 766: attR1 (tgt tca aac atg ttt)
 - Above line 766: Int (tag att ttg cat)



pDEST15 7013 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
108..776	GST
916..792	attR1
1025..1537	CmR
1804..1888	inactivated ccdA
2026..2331	ccdB
2372..2496	attR2
3233..4093	ampR

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1  ATCGAGATCT CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC
61 CCTCTAGAAA TAATTTTGTT TAACTTTAAG AAGGAGATAT ACATATGTCC CCTATACTAG
121 GTTATTGGAA AATTAAGGGC CTTGTGCAAC CCACTCGACT TCTTTTGGAA TATCTTGAAG
181 AAAAATATGA AGAGCATTTG TATGAGCGCG ATGAAGGTGA TAAATGGCGA AACAAAAAGT
241 TTGAATTGGG TTTGGAGTTT CCCAATCTTC CTTATTATAT TGATGGTGAT GTTAAATTAA
301 CACAGTCTAT GGCCATCATA CGTTATATAG CTGACAAGCA CAACATGTTG GGTGGTTGTC
361 CAAAAGAGCG TGCAGAGATT TCAATGCTTG AAGGAGCGGT TTTGGATATT AGATACGGTG
421 TTTCGAGAAT TGCATATAGT AAAGACTTTG AAACCTCAA AGTTGATTTT CTTAGCAAGC
481 TACCTGAAAT GCTGAAAATG TTCGAAGATC GTTTATGTCA TAAAACATAT TTAAATGGTG
541 ATCATGTAAAC CCATCCTGAC TTCATGTTGT ATGACGCTCT TGATGTTGTT TTATACATGG
601 ACCCAATGTG CCTGGATGCG TTCCCAAAT TAGTTTGTTT TAAAAACGT ATTGAAGCTA
661 TCCCACAAAT TGATAAGTAC TTGAAATCCA GCAAGTATAT AGCATGGCCT TTGCAGGGCT
721 GGCAAGCCAC GTTTGGTGGT GGCAGCCATC CTCCAAAATC GGATCTGGTT CCGCGTCCAT
781 GGTCGAATCA AACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAAT GATATAAATA
841 TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT AAAACACAAC
901 ATATCCAGTC ACTATGGCGG CCGCATTAGG CACCCAGGC TTTACACTTT ATGCTTCCGG
961 CTCGTATAAT GTGTGGATTT TGAGTTAGGA TCCGTCGAGA TTTTCAGGAG CTAAGGAAGC
1021 TAAATGGAG AAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA
1081 AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT
1141 GGATATTACG GCCTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTT ATCCGGCCTT
1201 TATTCACATT CTTGCCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA
1261 CCGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTCC ATGAGCAAAC
1321 TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT
1381 ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT
1441 TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGT TTGATTTAAA
1501 CGTGGCCAAT ATGGACAAC TCTTCGCCCC CGTTTTACC ATGGGCAAAT ATTATACGCA
1561 AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTAT CATGCCGTCT GTGATGGCTT
1621 CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC
1681 GTAATCTAGA GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT TGCGCGCTGA
1741 TTTTTCGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT
1801 GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA
1861 TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA GCCCGTCGTC
1921 TGCGTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCCCGGTTTA
1981 TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT
2041 TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG TGATATTATT
2101 GACACGCCCC GGCAGCGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT GTCAGATAAA
2161 GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG CATGATGACC
2221 ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA TCTCAGCCAC
2281 CGCGAAAATG ACATCAAAAA CGCCATTAAC CTGATGTTCT GGGGAATATA AATGTCAGGC
2341 TCCCTTATAC ACAGCCAGTC TGCAGGTCGA CCATAGTGAC TGGATATGTT GTGTTTTACA
2401 GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT ATATTGATAT TTATATCATT
2461 TTACGTTTCT CGTTCAGCTT TCTGTACAA AGTGGTTTGA TTCGACCCGG GATCCGGCTG
2521 CTAACAAAGC CCGAAAGGAA GCTGAGTTGG CTGCTGCCAC CGCTGAGCAA TAACTAGCAT
2581 AACCCCTTGG GGCCTCTAAA CGGGTCTTGA GGGGTTTTTT GCTGAAAGGA GGAATATAT
2641 CCGGATATCC ACAGGACGGG TGTGGTCGCC ATGATCGCGT AGTCGATAGT GGCTCCAAGT-

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FIGURE 35B

2701 AGCGAAGCGA GCAGGACTGG GCGGCGGCCA AAGCGGTCGG ACAGTGCTCC GAGAACGGGT
2761 GCGCATAGAA ATTGCATCAA CGCATATAGC GCTAGCAGCA CGCCATAGTG ACTGGCGATG
2821 CTGTTCGGAAT GGACGATATC CCGCAAGAGG CCCGGCAGTA CCGGCATAAC CAAGCCTATG
2881 CCTACAGCAT CCAGGGTGAC GGTGCCGAGG ATGACGATGA GCGCATTGTT AGATTTTCATA
2941 CACGGTGCCT GACTGCGTTA GCAATTTAAC TGTGATAAAC TACCGCATT AAGCTTATCG
3001 ATGATAAGCT GTCAAACATG AGAATTCTTG AAGACGAAAG GGCCTCGTGA TACGCCTATT
3061 TTTATAGGTT AATGTCATGA TAATAATGGT TTCTTAGACG TCAGGTGGCA CTTTTCGGGG
3121 AAATGTGCGC GGAACCCCTA TTTGTTTATT TTTCTAAATA CATTCAAATA TGTATCCGCT
3181 CATGAGACAA TAACCCTGAT AAATGCTTCA ATAATATTGA AAAAGGAAGA GTATGAGTAT
3241 TCAACATTTT CGTGTCGCCC TTATTCCCTT TTTTGCGGCA TTTTGCCTTC CTGTTTTTGC
3301 TCACCCAGAA ACGCTGGTGA AAGTAAAAGA TGCTGAAGAT CAGTTGGGTG CACGAGTGGG
3361 TTACATCGAA CTGGATCTCA ACAGCGGTAA GATCCTTGAG AGTTTTTCGCC CCGAAGAACG
3421 TTTTCCAATG ATGAGCACTT TTAAAGTTCT GCTATGTGGC GCGGTATTAT CCCGTGTTGA
3481 CGCCGGGCAA GAGCAACTCG GTCGCCGCAT ACACTATTCT CAGAATGACT TGGTTGAGTA
3541 CTCACCAGTC ACAGAAAAGC ATCTTACGGA TGGCATGACA GTAAGAGAAT TATGCAGTGC
3601 TGCCATAACC ATGAGTGATA ACACTGCGGC CAACTTACTT CTGACAACGA TCGGAGGACC
3661 GAAGGAGCTA ACCGCTTTTT TGCACAACAT GGGGGATCAT GTAACTCGCC TTGATCGTTG
3721 GGAACCGGAG CTGAATGAAG CCATACCAA CGACGAGCGT GACACCACGA TGCCTGCAGC
3781 AATGGCAACA ACGTTGCGCA AACTATTAA TGGCGAACTA CTTACTCTAG CTTCCCGGCA
3841 ACAATTAATA GACTGGATGG AGGCGGATAA AGTTGCAGGA CCACTTCTGC GCTCGGCCCT
3901 TCCGGCTGGC TGGTTTATTG CTGATAAATC TGGAGCCGGT GAGCGTGGGT CTCGCGGTAT
3961 CATTGCAGCA CTGGGGCCAG ATGGTAAGCC CTCCCGTATC GTAGTTATCT ACACGACGGG
4021 GAGTCAGGCA ACTATGGATG AACGAAATAG ACAGATCGCT GAGATAGGTG CCTCACTGAT
4081 TAAGCATTGG TAAGTGTGAG ACCAAGTTTA CTCATATATA CTTTAGATTG ATTTAAAACT
4141 TCATTTTTTAA TTTAAAAGGA TCTAGGTGAA GATCCTTTTT GATAATCTCA TGACCAAAT
4201 CCCTTAACGT GAGTTTTTCGT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC
4261 TTCTTGAGAT CCTTTTTTTC TGC GCGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT
4321 ACCAGCGGTG GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAAGTGG
4381 CTTCAGCAGA GCGCAGATAC CAAATACTGT CCTTCTAGTG TAGCCGTAGT TAGGCCACCA
4441 CTTCAAGAAC TCTGTAGCAC CGCCTACATA CCTCGCTCTG CTAATCCTGT TACCAGTGGC
4501 TGCTGCCAGT GGCGATAAGT CGTGTCTTAC CGGGTTGGAC TCAAGACGAT AGTTACCGGA
4561 TAAGGCGCAG CGGTCGGGCT GAACGGGGGG TTCGTGCACA CAGCCCAGCT TGGAGCGAAC
4621 GACCTACACC GAAGTGAGAT ACCTACAGCG TGAGCTATGA GAAAGCGCCA CGCTTCCCGA
4681 AGGGAGAAAG GCGGACAGGT ATCCGGTAAG CGGCAGGGTC GGAACAGGAG AGCGCACGAG
4741 GGAGCTTCCA GGGGGAACG CCTGGTATCT TTATAGTCCT GTCGGGTTTC GCCACCTCTG
4801 ACTTGAGCGT CGATTTTTGT GATGCTCGTC AGGGGGGCGG AGCCTATGGA AAAACGCCAG
4861 CAACGCGGCC TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTTCTTTCC
4921 TGC GTTATCC CCTGATTCTG TGGATAACCG TATTACCGCC TTTGAGTGAG CTGATACCGC
4981 TCGCCGCAGC CGAACGACCG AGCGCAGCGA GTCAGTGAGC GAGGAAGCGG AAGAGCGCCT
5041 GATGCGGTAT TTTCTCCTTA CGCATCTGTG CGGTATTTCA CACCGCATAT ATGGTGCACT
5101 CTCAGTACAA TCTGCTCTGA TGCCGCATAG TTAAGCCAGT ATACACTCCG CTATCGCTAC
5161 GTGACTGGGT CATGGCTGCG CCCCACACCG CGCCAACACC CGCTGACGCG CCCTGACGGG
5221 CTTGTCTGCT CCCGGCATCC GCTTACAGAC AAGCTGTGAC CGTCTCCGGG AGCTGCATGT
5281 GTCAGAGGTT TTCACCGTCA TCACCGAAAC GCGCGAGGCA GCTGCGGTAA AGCTCATCAG
5341 CGTGGTCGTG AAGCGATTCA CAGATGTCTG CCTGTTTATC CGCGTCCAGC TCGTTGAGTT
5401 TCTCCAGAAG CGTTAATGTC TGGCTTCTGA TAAAGCGGGC CATGTTAAGG GCGGTTTTTT
5461 CCTGTTTGGT CACTGATGCC TCCGTGTAAG GGGGATTTCT GTTCATGGGG GTAATGATAC
5521 CGATGAAACG AGAGAGGATG CTCACGATAC GGGTTACTGA TGATGAACAT GCCCGGTTAC
5581 TGGAACGTTG TGAGGGTAAA CAACTGGCGG TATGGATGCG GCGGGACCAG AGAAAAATCA
5641 CTCAGGGTCA ATGCCAGCGC TTCGTTAATA CAGATGTAGG TGTTCCACAG GGTAGCCAGC
5701 AGCATCCTGC GATGCAGATC CGGAACATAA TGGTGCAGGG CGCTGACTTC CGCGTTTCCA
5761 GACTTTACGA AACACGGAAC CCGAAGACCA TTCATGTTGT TGCTCAGGTC GCAGACGTTT
5821 TGCAGCAGCA GTCGCTTCAC GTTCGCTCGC GTATCGGTGA TTCATTCTGC TAACCAGTAA
5881 GGCAACCCCG CCAGCCTAGC CGGGTCCTCA ACGACAGGAG CACGATCATG CGCACCCGTG
5941 GCCAGGACCC AACGCTGCCC GAGATGCGCC GCGTGCGGCT GCTGGAGATG GCGGACGCGA
6001 TGGATATGTT CTGCCAAGGG TTGGTTTTCG CATTACAGT TCTCCGCAAG AATTGATTGG
6061 CTCCAATTCT TGGAGTGGTG AATCCGTTAG CGAGGTGCCG CCGGCTTCCA TTCAGGTCTG
6121 GGTGGCCCGG CTCCATGCAC CGCGACGCAA CGCGGGGAGG CAGACAAGGT ATAGGGCGGC-

FIGURE 35C

6181	GCCTACAATC	CATGCCAACC	CGTTCCATGT	GCTCGCCGAG	GCGGCATAAA	TCGCCGTGAC
6241	GATCAGCGGT	CCAGTGATCG	AAGTTAGGCT	GGTAAGAGCC	GCGAGCGATC	CTTGAAGCTG
6301	TCCCTGATGG	TCGTCATCTA	CCTGCCTGGA	CAGCATGGCC	TGCAACGCGG	GCATCCCGAT
6361	GCCGCCGGAA	GCGAGAAGAA	TCATAATGGG	GAAGGCCATC	CAGCCTCGCG	TCGCGAACGC
6421	CAGCAAGACG	TAGCCCAGCG	CGTCGGCCGC	CATGCCGGCG	ATAATGGCCT	GCTTCTCGCC
6481	GAAACGTTTG	GTGGCGGGAC	CAGTGACGAA	GGCTTGAGCG	AGGGCGTGCA	AGATTCCGAA
6541	TACCGCAAGC	GACAGGCCGA	TCATCGTCGC	GCTCCAGCGA	AAGCGGTCCT	CGCCGAAAAT
6601	GACCCAGAGC	GCTGCCGGCA	CCTGTCCCTAC	GAGTTGCATG	ATAAAGAAGA	CAGTCATAAG
6661	TGCGGCGACG	ATAGTCATGC	CCCGCGCCCA	CCGGAAGGAG	CTGACTGGGT	TGAAGGCTCT
6721	CAAGGGCATC	GGTCGATCGA	CGCTCTCCCT	TATGCGACTC	CTGCATTAGG	AAGCAGCCCA
6781	GTAGTAGGTT	GAGGCCGTTG	AGCACCGCCG	CCGCAAGGAA	TGGTGCATGC	AAGGAGATGG
6841	CGCCCAACAG	TCCCCCGGCC	ACGGGGCCTG	CCACCATAAC	CACGCCGAAA	CAAGCGCTCA
6901	TGAGCCCGAA	GTGGCGAGCC	CGATCTTCCC	CATCGGTGAT	GTCGGCGATA	TAGGCGCCAG
6961	CAACCGCACC	TGTGGCGCCG	GTGATGCCGG	CCACGATGCG	TCCGGCGTAG	AGG

[illegible]

FIGURE 351)

Figure 36A: pDEST16

Thioredoxin N-Fusion Protein in E. coli with T7 Promoter

1 gat ctc gat ccc gcg aaa tta ata cga ctc act ata ggg aga cca caa cgg
cta gag cta ggg cgc ttt aat tat gct gag tga tat ccc tct ggt gtt gcc

52 ttt ccc tct aga aat aat ttt gtt taa ctt taa gaa gga gat ata cat atg Start
aaa ggg aga tct tta tta aaa caa att gaa att ctt cct cta tat gta tac Translation Trx

103 S D K - - - cac ctg act gac gac agt ttt gac acg gat gta ctc
tcg cta ttt taa taa gtg gac tga ctg ctg tca aaa ctg tgc cta cat gag //

//-358 gtg gcg gca acc aaa gtg ggt gca ctg tct aaa ggt cag ttg aaa gag ttc
cac cgc cgt tgg ttt cac cca cgt gac aga ttt cca gtc aac ttt ctc aag

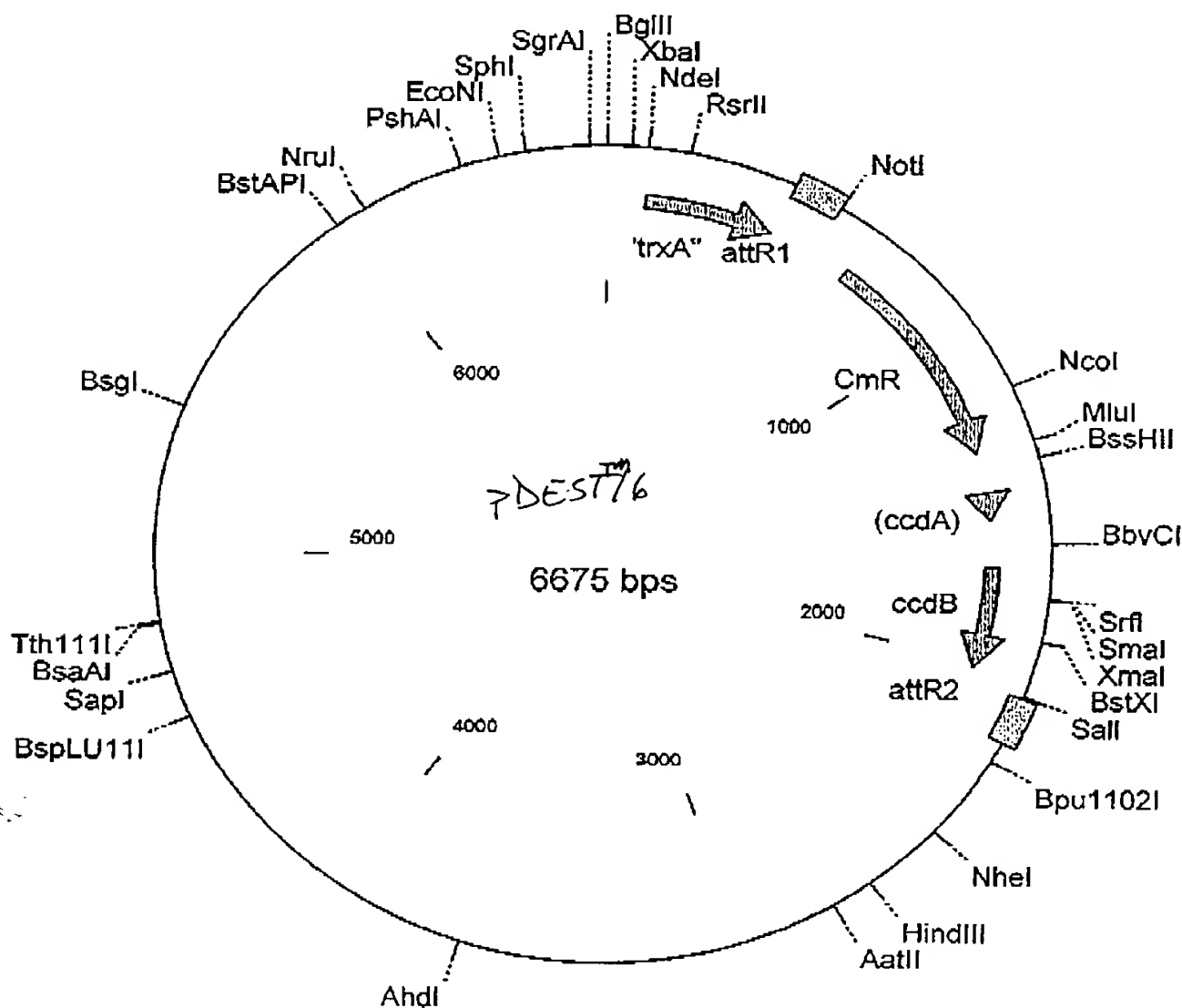
409 ctc gac gct aac ctg gcc ggt tct ggt tct ggt gat gac gat gac aag atc
gag ctg cga ttg gac cgg cca aga cca cta ctg cta ctg ttc tag

460 T S L Y K K A attR1
aca agt ttg tac aaa aaa gct gaa cga gaa acg taa aat gat ata aat atc
tgt tca aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat tta tag //

T7 Promoter mRNA

XbaI NdeI

Int



pDEST16 6675 bp

<u>Location (Base Nos.)</u>		<u>Gene Encoded</u>
104..457		trxA
585..461		attR1
694..1353		CmR
1473..1557		inactivated ccdA
1695..2000		ccdB
2041..2165		attR2
1	AGATCTCGAT CCCGCGAAAT TAATACGACT CACTATAGGG AGACCACAAC GGTTCCTC	
61	TAGAAATAAT TTTGTTTAAAC TTAAAGAAGG AGATATACAT ATGAGCGATA AAATTATTCA	
121	CCTGACTGAC GACAGTTTTG ACACGGATGT ACTCAAAGCG GACGGGGCGA TCCTCGTCGA	
181	TTTCTGGGCA GAGTGGTGCG GTCCGTGCAA AATGATCGCC CCGATTCTGG ATGAAATCGC	
241	TGACGAATAT CAGGGCAAAC TGACCGTTGC AAAACTGAAC ATCGATCAAA ACCCTGGCAC	
301	TGCGCCGAAA TATGGCATCC GTGGTATCCC GACTCTGCTG CTGTTCAAAA ACGGTGAAGT	
361	GGCGGCAACC AAAGTGGGTG CACTGTCTAA AGGTCAGTTG AAAGAGTTCC TCGACGCTAA	
421	CCTGGCCGGT TCTGGTTCTG GTGATGACGA TGACAAGATC ACAAGTTTGT ACAAAAAAGC	
481	TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA	
541	ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCATTAGGC	
601	ACCCAGGCT TTACACTTTA TGCTTCCGGC TCGTATAATG TGTGGATTTT GAGTTAGGAT	
661	CCGGCGAGAT TTTCAGGAGC TAAGGAAGCT AAAATGGAGA AAAAAATCAC TGGATATACC	
721	ACCGTTGATA TATCCCAATG GCATCGTAAA GAACATTTTG AGGCATTTCA GTCAGTTGCT	
781	CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG CCTTTTAAA GACCGTAAAG	
841	AAAAATAAGC ACAAGTTTAA TCCGGCCTTT ATTCACATTC TTGCCCCGCT GATGAATGCT	
901	CATCCGGAAT TCCGTATGGC AATGAAAGAC GGTGAGCTGG TGATATGGGA TAGTGTTTAC	
961	CCTTGTTACA CCGTTTTCCA TGAGCAAAC TAAACGTTTT CATCGCTCTG GAGTGAATAC	
1021	CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG ATGTGGCGTG TTACGGTGAA	
1081	AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT TTTTCGTCTC AGCCAATCCC	
1141	TGGGTGAGTT TCACCAGTTT TGATTTAAAC GTGGCCAATA TGGACAACCT CTTCGCCCCC	
1201	GTTTTACCA TGGGCAAATA TTATACGCAA GGCGACAAGG TGCTGATGCC GCTGGCGATT	
1261	CAGGTTTCATC ATGCCGTCTG TGATGGCTTC CATGTGCGCA GAATGCTTAA TGAATTACAA	
1321	CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG GATCCGGCTT ACTAAAAGCC	
1381	AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA TAAGAATATA TACTGATATG	
1441	TATACCCGAA GTATGTCAAA AAGAGGTGTG CTATGAAGCA GCGTATTACA GTGACAGTTG	
1501	ACAGCGACAG CTATCAGTTG CTCAAGGCAT ATATGATGTC AATATCTCCG GTCTGGTAAG	
1561	CACAACCATG CAGAATGAAG CCCGTCGTCT GCGTGCCGAA CGCTGGAAAG CGGAAATCA	
1621	GGAAGGGATG GCTGAGGTCG CCCGGTTTAT TGAAATGAAC GGCTCTTTTG CTGACGAGAA	
1681	CAGGGACTGG TGAAATGCAG TTAAAGGTTT ACACCTATAA AAGAGAGAGC CGTTATCGTC	
1741	TGTTTGTGGA TGTACAGAGT GATATTATTG ACACGCCCCG GCGACGGATG GTGATCCCCC	
1801	TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA ACTTTACCCG GTGGTGCATA	
1861	TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC CAGTGTGCCG GTCTCCGTTA	
1921	TCGGGGAAGA AGTGGCTGAT CTCAGCCACC GCGAAAATGA CATCAAAAAC GCCATTAACC	
1981	TGATGTTCTG GGGAATATAA ATGTCAGGCT CCCTTATACA CAGCCAGTCT GCAGGTCGAC	
2041	CATAGTGAAT GGATATGTTG TGTTTTACAG TATTATGTAG TCTGTTTTTT ATGCAAAATC	
2101	TAATTTAATA TATTGATATT TATATCATTT TACGTTTCTC GTTCAGCTTT CTTGTACAAA	
2161	GTGGTGATGA TCCGGCTGCT AACAAAGCCC GAAAGGAAGC TGAGTTGGCT GCTGCCACCG	
2221	CTGAGCAATA ACTAGCATAA CCCCTTGGGG CCTCTAAACG GGTCTTGAGG GGTTTTTTGC	
2281	TGAAAGGAGG AACTATATCC GGATATCCAC AGGACGGGTG TGGTCGCCAT GATCGCGTAG	
2341	TCGATAGTGG CTCCAAGTAG CGAAGCGAGC AGGACTGGGC GGCGGCCAAA GCGGTCGGAC	
2401	AGTGCTCCGA GAACGGGTGC GCATAGAAAT TGCATCAACG CATATAGCGC TAGCAGCACG	
2461	CCATAGTGAC TGGCGATGCT GTCGGAATGG ACGATATCCC GCAAGAGGCC CGGCAGTACC	
2521	GGCATAACCA AGCCTATGCC TACAGCATCC AGGGTGACGG TGCCGAGGAT GACGATGAGC	
2581	GCATTGTTAG ATTTTCATACA CGGTGCCTGA CTGCGTTAGC AATTTAACTG TGATAAACTA	
2641	CCGCATTAAA GCTTATCGAT GATAAGCTGT CAAACATGAG AATTCTTGAA GACGAAAGGG	
2701	CCTCGTGATA CGCCTATTTT TATAGGTTAA TGTCATGATA ATAATGGTTT CTTAGACGTC	
2761	AGGTGGCACT TTTCGGGGAA ATGTGCGCGG AACCCCTATT TGTTTATTTT TCTAAATACA-	

Figure 36B

6301 AAAGAAGACA GTCATAAGTG CGGCGACGAT AGTCATGCCC CGCGCCCACC GGAAGGAGCT
6361 GACTGGGTTG AAGGCTCTCA AGGGCATCGG TCGATCGACG CTCTCCCTTA TCGACTCCT
6421 GCATTAGGAA GCAGCCCAGT AGTAGGTTGA GGCCGTTGAG CACCGCCGCC GCAAGGAATG
6481 GTGCATGCAA GGAGATGGCG CCCAACAGTC CCCC GGCCAC GGGGCCTGCC ACCATACCCA
6541 CGCCGAAACA AGCGCTCATG AGCCCGAAGT GGCGAGCCCG ATCTTCCCA TCGGTGATGT
6601 CGGCGATATA GGCGCCAGCA ACCGCACCTG TGGCGCCGGT GATGCCGGCC ACGATGCGTC
6661 CGGCGTAGAG GATCG

FIGURE 36D

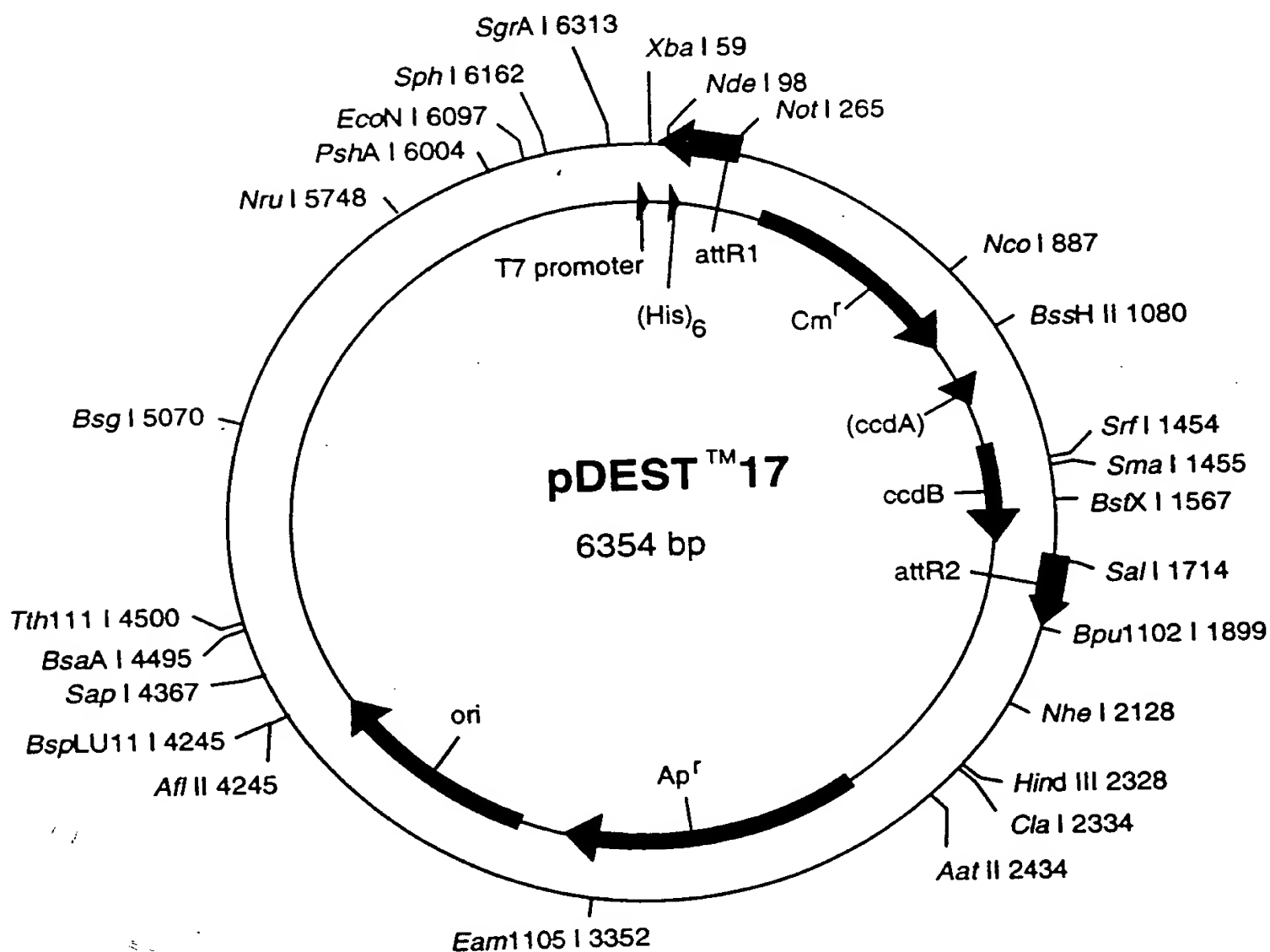
Figure 37A: pDEST17 His6 Fusion in *E. coli* T7 Promoter

1 gat ccc gcg aaa tta ata cga ctc act ata ggg aga cca caa cgg ttt ccc
 cta ggg cgc ttt aat tat gct gag tga tat ccc tct ggt gtt gcc aaa ggg

52 tct aga aat aat ttt gtt taa ctt taa gaa gga gat ata cat atg tgg tac
 aga tct tta tta aaa caa att gaa att ctt cct cta tat gta tac agc atg

103 Y H H H H H H L E S T S L Y K K A
 tac cat cac cat cac cat cac ctc gaa tca aca agt ttg tac aaa aaa gct
 atg gta gtg gta gtg gta gtg gag ctt agt tgt tca aac atg ttt ttt cga

T7 Promoter *mRNA* *Start Translation* *attR1* *Int*



pDEST17 6354 bp

Location (Base Nos.)

Gene Encoded

258..134	attR1
367..1026	CmR
1146..1230	inactivated ccdA
1368..1673	ccdB
1714..1838	attR2
2564..3421	ampR

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1  CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGAAA
61 TAATTTTGTT TAACTTTAAG AAGGAGATAT ACATATGTCT TACTACCATC ACCATCACCA
121 TCACCTCGAA TCAACAAGTT TGTACAAAAA AGCTGAACGA GAAACGTAAA ATGATATAAA
181 TATCAATATA TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAAACACA
241 ACATATCCAG TCACTATGGC GGCCGCATTA GGCACCCAG GCTTTACACT TTATGCTTCC
301 GGCTCGTATA ATGTGTGGAT TTTGAGTTAG GATCCGTCGA GATTTTCAGG AGCTAAGGAA
361 GCTAAAATGG AGAAAAAAT CACTGGATAT ACCACCGTTG ATATATCCCA ATGGCATCGT
421 AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA CCTATAACCA GACCGTTCAG
481 CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA AGCACAAGTT TTATCCGGCC
541 TTTATTCACA TTCTTGCCCG CCTGATGAAT GCTCATCCGG AATTCCGTAT GGCAATGAAA
601 GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT ACACCGTTTT CCATGAGCAA
661 ACTGAAACGT TTTCATCGCT CTGGAGTGAA TACCACGACG ATTTCCGGCA GTTTCTACAC
721 ATATATTCGC AAGATGTGGC GTGTTACGGT GAAAACCTGG CCTATTTCCC TAAAGGGTTT
781 ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA GTTTCACCAG TTTTGATTTA
841 AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA CCATGGGCAA ATATTATACG
901 CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGGTTT ATCATGCCGT CTGTGATGGC
961 TTCCATGTCT GCAGAATGCT TAATGAATTA CAACAGTACT GCGATGAGTG GCAGGGCGGG
1021 GCGTAAAGAT CTGGATCCGG CTTACTAAAA GCCAGATAAC AGTATGCGTA TTTGCGCGCT
1081 GATTTTTGCG GTATAAGAAT ATATACTGAT ATGTATACCC GAAGTATGTC AAAAAGAGGT
1141 GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA CAGCTATCAG TTGCTCAAGG
1201 CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC ATGCAGAATG AAGCCCGTCG
1261 TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG TCGCCCGGTT
1321 TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC TGGTGAAATG CAGTTTAAGG
1381 TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT GGATGTACAG AGTGATATTA
1441 TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG TGCACGTCTG CTGTCAGATA
1501 AAGTCTCCCG TGAACTTTAC CCGGTGCTGC ATATCGGGGA TGAAAGCTGG CGCATGATGA
1561 CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA AGAAGTGGCT GATCTCAGCC
1621 ACCGCGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT CTGGGGAATA TAAATGTCAG
1681 GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTG ACTGGATATG TTGTGTTTTA
1741 CAGTATTATG TAGTCTGTTT TTTATGCAAA ATCTAATTTA ATATATTGAT ATTTATATCA
1801 TTTTACGTTT CTCGTTTCAGC TTTCTTGTTT AAAGTGGTTG ATTCGAGGCT GCTAACAAAG
1861 CCCGAAAGGA AGCTGAGTTG GCTGCTGCCA CCGCTGAGCA ATAACCTAGC TAACCCCTTG
1921 GGGCCTCTAA ACGGGTCTTG AGGGGTTTTT TGCTGAAAGG AGGAACTATA TCCGGATATC
1981 CACAGGACGG GTGTGGTTCG CATGATCGCG TAGTCGATAG TGGCTCCAAG TAGCGAAGCG
2041 AGCAGGACTG GGCAGCGGCC AAAGCGGTCG GACAGTGCTC CGAGAACGGG TGCGCATAGA
2101 AATTGCATCA ACGCATATAG CGCTAGCAGC ACGCCATAGT GACTGGCGAT GCTGTCGGAA
2161 TGGACGATAT CCCGCAAGAG GCCCGGCAGT ACCGGCATAA CCAAGCCTAT GCCTACAGCA
2221 TCCAGGGTGA CGGTGCCGAG GATGACGATG AGCGCATTGT TAGATTTTCAT ACACGGTGCC
2281 TGA CTGCGTT AGCAATTTAA CTGTGATAAA CTACCGCATT AAAGCTTATC GATGATAAGC
2341 TGTCAAACAT GAGAATTCTT GAAGACGAAA GGGCCTCGTG ATACGCCTAT TTTTATAGGT
2401 TAATGTCATG ATAATAATGG TTTCTTAGAC GTCAGGTGGC ACTTTTCGGG GAAATGTGCG
2461 CGGAACCCCT ATTTGTTTAT TTTTCTAAAT ACATTCAAAT ATGTATCCGC TCATGAGACA
2521 ATAACCCCTGA TAAATGCTTC AATAATATTG AAAAAGGAAG AGTATGAGTA TTCAACATTT
2581 CCGTGTGCGC CTTATTCCTT TTTTTCGGGC ATTTTGCCTT CCTGTTTTTG CTCACCCAGA
2641 AACGCTGGTG AAAGTAAAAG ATGCTGAAGA TCAGTTGGGT GCACGAGTGG GTTACATCGA-

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FIGURE 37B

2701 ACTGGATCTC AACAGCGGTA AGATCCTTGA GAGTTTTTCGC CCCGAAGAAC GTTTTCCAAT
2761 GATGAGCACT TTTAAAGTTC TGCTATGTGG CGCGGTATTA TCCCGTGTTG ACGCCGGGCA
2821 AGAGCAACTC GGTCGCCGCA TACACTATTC TCAGAATGAC TTGGTTGAGT ACTCACCAGT
2881 CACAGAAAAG CATCTTACGG ATGGCATGAC AGTAAGAGAA TTATGCAGTG CTGCCATAAC
2941 CATGAGTGAT AACACTGCGG CCAACTTACT TCTGACAACG ATCGGAGGAC CGAAGGAGCT
3001 AACCGCTTTT TTGCACAACA TGGGGGATCA TGTAACTCGC CTTGATCGTT GGGAACCGGA
3061 GCTGAATGAA GCCATACCAA ACGACGAGCG TGACACCACG ATGCCTGCAG CAATGGCAAC
3121 AACGTTGCGC AAACATATTAA CTGGCGAACT ACTTACTCTA GCTTCCCGGC AACAATTAAT
3181 AGACTGGATG GAGGCGGATA AAGTTGCAGG ACCACTTCTG CGCTCGGCCC TTCCGGCTGG
3241 CTGGTTTATT GCTGATAAAT CTGGAGCCGG TGAGCGTGGG TCTCGCGGTA TCATTGCAGC
3301 ACTGGGGCCA GATGGTAAGC CCTCCCGTAT CGTAGTTATC TACACGACGG GGAGTCAGGC
3361 AACTATGGAT GAACGAAATA GACAGATCGC TGAGATAGGT GCCTCACTGA TTAAGCATTG
3421 GTAACGTGCA GACCAAGTTT ACTCATATAT ACTTTAGATT GATTTAAAC TTCATTTTAA
3481 ATTTAAAAGG ATCTAGGTGA AGATCCTTTT TGATAATCTC ATGACCAAAA TCCCTTAACG
3541 TGAGTTTTTCG TTCCACTGAG CGTCAGACCC CGTAGAAAAG ATCAAAGGAT CTTCTTGAGA
3601 TCCTTTTTTT CTGCGCGTAA TCTGCTGCTT GCAAACAAAA AAACCACCGC TACCAGCGGT
3661 GGTTTGTTTG CCGGATCAAG AGCTACCAAC TCTTTTTTCCG AAGGTAAC TGCTTCAGCAG
3721 AGCGCAGATA CCAAATACTG TCCTTCTAGT GTAGCCGTAG TTAGGCCACC ACTTCAAGAA
3781 CTCTGTAGCA CCGCCTACAT ACCTCGCTCT GCTAATCCTG TTACCAGTGG CTGCTGCCAG
3841 TGGCGATAAG TCGTGTCTTA CCGGGTTGGA CTCAAGACGA TAGTTACCGG ATAAGGCGCA
3901 GCGGTCGGGC TGAACGGGGG GTTCGTGCAC ACAGCCCAGC TTGGAGCGAA CGACCTACAC
3961 CGAACTGAGA TACCTACAGC GTGAGCTATG AGAAAGCGCC ACGCTTCCCG AAGGGAGAAA
4021 GGCGGACAGG TATCCGGTAA GCGGCAGGGT CGGAACAGGA GAGCGCACGA GGGAGCTTCC
4081 AGGGGGAAAC GCCTGGTATC TTTATAGTCC TGTCGGGTTT CGCCACCTCT GACTTGAGCG
4141 TCGATTTTTG TGATGCTCGT CAGGGGGGCG GAGCCTATGG AAAACGCCA GCAACGCGGC
4201 CTTTTTACGG TTCCTGGCCT TTTGCTGGCC TTTTGCTCAC ATGTTCTTTC CTGCGTTATC
4261 CCCTGATTCT GTGGATAACC GTATTACCGC CTTTGAGTGA GCTGATACCG CTCGCCGAG
4321 CCGAACGACC GAGCGCAGCG AGTCAGTGAG CGAGGAAGCG GAAGAGCGCC TGATGCGGTA
4381 TTTTCTCCTT ACGCATCTGT GCGGTATTTT ACACCGCATA TATGGTGCAC TCTCAGTACA
4441 ATCTGCTCTG ATGCCGCATA GTTAAGCCAG TATACACTCC GCTATCGCTA CGTGACTGGG
4501 TCATGGCTGC GCCCCGACAC CCGCCAACAC CCGCTGACGC GCCCTGACGG GCTTGTCTGC
4561 TCCCGGCATC CGCTTACAGA CAAGCTGTGA CCGTCTCCGG GAGCTGCATG TGTCAGAGGT
4621 TTTCACCGTC ATCACCGAAA CGCGCGAGGC AGCTGCGGTA AAGCTCATCA GCGTGGTCGT
4681 GAAGCGATTG ACAGATGTCT GCCTGTTCAT CCGCGTCCAG CTCGTTGAGT TTCTCCAGAA
4741 GCGTTAATGT CTGGCTTCTG ATAAAGCGGG CCATGTAAAG GGCGGTTTTT TCCTGTTTGG
4801 TCACTGATGC CTCCGTGTAA GGGGGATTTC TGTTTCATGGG GGTAATGATA CCGATGAAAC
4861 GAGAGAGGAT GCTCACGATA CGGGTACTG ATGATGAACA TGCCCGGTTA CTGGAACGTT
4921 GTGAGGGTAA ACAACTGGCG GTATGGATGC GCGGGGACCA GAGAAAAATC ACTCAGGGTC
4981 AATGCCAGCG CTTCTGTTAAT ACAGATGTAG GTGTTCCACA GGGTAGCCAG CAGCATCCTG
5041 CGATGCAGAT CCGGAACATA ATGGTGCAGG GCGCTGACTT CCGCGTTTCC AGACTTTACG
5101 AAACACGGAA ACCGAAGACC ATTCATGTTG TTGCTCAGGT CGCAGACGTT TTGCAGCAGC
5161 AGTCGCTTCA CGTTCGCTCG CGTATCGGTG ATTCATTCTG CTAACCAGTA AGGCAACCCC
5221 GCCAGCCTAG CCGGGTCCTC AACGACAGGA GCACGATCAT GCGCACCCGT GGCCAGGACC
5281 CAACGCTGCC CGAGATGCGC CGCGTGCGGC TGCTGGAGAT GGCGGACGCG ATGGATATGT
5341 TCTGCCAAGG GTTGGTTTGC GCATTACAG TTCTCCGCAA GAATTGATTG GCTCCAATTC
5401 TTGGAGTGGT GAATCCGTTA GCGAGGTGCC GCCGGCTTCC ATTCAGGTG AGGTGGCCCCG
5461 GCTCCATGCA CCGCGACGCA ACGCGGGGAG GCAGACAAGG TATAGGGCGG CGCCTACAAT
5521 CCATGCCAAC CCGTTCCATG TGCTCGCCGA GCGGCATAA ATCGCCGTGA CGATCAGCGG
5581 TCCAGTGATC GAAGTTAGGC TGGTAAGAGC CGCGAGCGAT CCTTGAAGCT GTCCCTGATG
5641 GTCGTCATCT ACCTGCCTGG ACAGCATGGC CTGCAACGCG GGCATCCCGA TGCCGCCGGA
5701 AGCGAGAAGA ATCATAATGG GGAAGGCCAT CCAGCCTCGC GTCGCGAACG CCAGCAAGAC
5761 GTAGCCCAGC GCGTCGGCCG CCATGCCGGC GATAATGGCC TGCTTCTCGC CGAAACGTTT
5821 GGTGGCGGGA CCAGTGACGA AGGCTTGAGC GAGGGCGTGC AAGATTCCGA ATACCGCAAG
5881 CGACAGGCCG ATCATCGTCG CGCTCCAGCG AAAGCGGTCC TCGCCGAAAA TGACCCAGAG
5941 CGCTGCCGGC ACCTGTCTTA CGAGTTGCAT GATAAAGAAG ACAGTCATAA GTGCGGCGAC
6001 GATAGTCATG CCCC GCGCCC ACCGGAAGGA GCTGACTGGG TTGAAGGCTC TCAAGGGCAT
6061 CCGTCGATCG ACGCTCTCCC TTATGCGACT CCTGCATTAG GAAGCAGCCC AGTAGTAGGT
6121 TGAGGCCGTT GAGCACCGCC GCCGCAAGGA ATGGTGCATG CAAGGAGATG GCGCCCAACA-

6181 GTCCCCCGGC CACGGGGCCT GCCACCATAC CCACGCCGAA ACAAGCGCTC ATGAGCCCGA
6241 AGTGGCGAGC CCGATCTTCC CCATCGGTGA TGTCGGCGAT ATAGGCGCCA GCAACCGCAC
6301 CTGTGGCGCC GGTGATGCCG GCCACGATGC GTCCGGCGTA GAGGATCGAG ATCT

FIGURE 37D

Figure 38A: pDEST18

FastBac Transfer Vector with p10 Baculovirus Promoter

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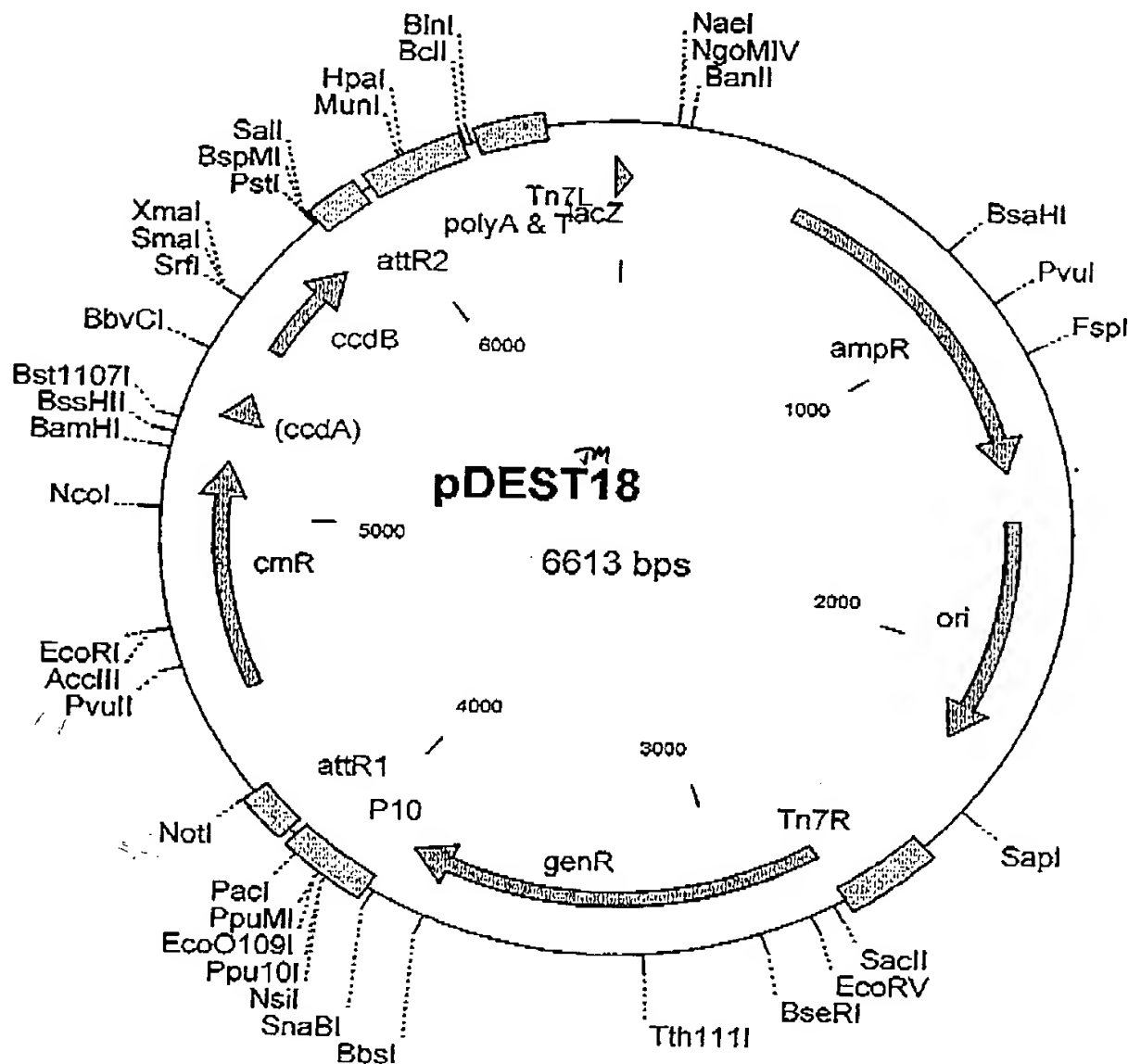
1  gaagacctcg gccgtcgccg cgcttgccgg tgggtgctgac cccggatgaa gtggttcgca
   cttctgggagc cggcagcgcc gcgaacggcc accacgactg gggcctactt caccaagcgt

61  tcttcggttt tctggaagge gagcctcgtt tgttcgcccga ggactctagc tatagttcta
   aggagccaaa agaccttcgc ctcgtagcaa acaagcgggt cctgagatcg atatcaagat

121  gtggtttggct acgtatcgag caagaaataa aaacggccaa ccggttggag tcttctgtgc
   caccaaccga tgcatagtct gttcttttat tttgctggtt gcgaacctc agaacaacac
181  // tatctttaca aagatccaga aatagcgaac attacaaca aggggggacta tgaattatg //
   // aaaaaaatgt ttctaagtct ttatgcgtag tgaatgttgt tccccctgat acittaatac //
241  // cattttgagg atgcccggag ctttaattca acccaacaca atatattata gttaaataag // mRNA
   // gaaaaactcc tacggccctg gaaattaaat tgggttctgt tatataatat caatttatcc //
301  // aattatttat caaatcattt gtataattaat taaaatacta tactgtaaat tacattttat
   // taaataaata gtttagtaaa oataaatta attttatgat atgacattta atgtaaaata
361  ttacaatgag gatcatcaca agtttgtaca aaaaagctga acgagaaacg taaaatgata
   aatgttactc ctagtagtgt tcaaacatgt tttttcgact tgctctttgc attttactat

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Int ↓ attR1



pDEST18 6613 bp

Location (Base Nos.)	Gene Encoded
474..1449	ampR
1590..2244	ori
2738..3850	genR
4251..4127	attR1
4501..5160	CmR
5280..5364	inactivated ccdA
5502..5807	ccdB
5848..5972	attR2
6595..25	lacZ

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1  GACGCGCCCT GTAGCGGCGC ATTAAGCGCG GCGGGTGTGG TGGTTACGCG CAGCGTGACC
61 GCTACACTTG CCAGCGCCCT AGCGCCCGCT CCTTTCGCTT TCTTCCCTTC CTTTCTCGCC
121 ACGTTCGCCG GCTTTCCTCCG TCAAGCTCTA AATCGGGGGC TCCCTTTAGG GTTCCGATTT
181 AGTGCTTTAC GGCACCTCGA CCCCAAAAAA CTTGATTAGG GTGATGGTTC ACGTAGTGGG
241 CCATCGCCCT GATAGACGGT TTTTCGCCCT TTGACGTTGG AGTCCACGTT CTTTAATAGT
301 GGA CTCTTGT TCCAAACTGG AACAACTACT AACCTATCT CGGTCTATTC TTTTGATTTA
361 TAAGGGATTT TGCCGATTTC GGCCTATTGG TTAAAAAATG AGCTGATTTA AAAAAAATTT
421 AACGCGAATT TTAACAAAAT ATTAACGTTT ACAATTTTCA GTGGCACTTT TCGGGGAAAT
481 GTGCGCGGAA CCCCTATTTG TTTATTTTTC TAAATACATT CAAATATGTA TCCGCTCATG
541 AGACAATAAC CCTGATAAAT GCTTCAATAA TATTGAAAAA GGAAGAGTAT GAGTATTCAA
601 CATTTCCGTG TCGCCCTTAT TCCCTTTTTT GCGGCATTTT GCCTTCCTGT TTTTGCTCAC
661 CCAGAAACGC TGGTGAAAGT AAAAGATGCT GAAGATCAGT TGGGTGCACG AGTGGGTAC
721 ATCGAACTGG ATCTCAACAG CGGTAAGATC CTTGAGAGTT TTCGCCCGA AGAACGTTTT
781 CCAATGATGA GCACTTTTAA AGTTCTGCTA TGTGGCGCGG TATTATCCCG TATTGACGCC
841 GGGCAAGAGC AACTCGGTCT CCGCATACAC TATTCTCAGA ATGACTTGGT TGAGTACTCA
901 CCAGTCACAG AAAAGCATCT TACGGATGGC ATGACAGTAA GAGAATTATG CAGTGCTGCC
961 ATAACCATGA GTGATAACAC TGCGGCCAAC TTACTTCTGA CAACGATCGG AGGACCGAAG
1021 GAGCTAACCG CTTTTTTTGA CAACATGGGG GATCATGTAA CTCGCCTTGA TCGTTGGGAA
1081 CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA CCACGATGCC TG TAGCAATG
1141 GCAACAACGT TCGCGAAACT ATTAAC TGGC GAACTACTTA CTCTAGCTTC CCGGCAACAA
1201 TTAATAGACT GGATGGAGGC GGATAAAGTT GCAGGACCAC TTCTGCGCTC GGCCCTTCCG
1261 GCTGGCTGGT TTATTGCTGA TAAATCTGGA GCCGGTGAGC GTGGGTCTCG CGGTATCATT
1321 GCAGCACTGG GGCCAGATGG TAAGCCCTCC CGTATCGTAG TTATCTACAC GACGGGGAGT
1381 CAGGCAACTA TGGATGAACG AAATAGACAG ATCGCTGAGA TAGGTGCCTC ACTGATTAAG
1441 CATTGGTAAC TGTCAGACCA AGTTTACTCA TATATACTTT AGATTGATTT AAAACTTCAT
1501 TTTTAATTTA AAAGGATCTA GGTGAAGATC CTTTTTTGATA ATCTCATGAC CAAAATCCCT
1561 TAACGTGAGT TTTCGTTCCA CTGAGCGTCA GACCCCGTAG AAAAGATCAA AGGATCTTCT
1621 TGAGATCCTT TTTTCTGCG CGTAATCTGC TGCTTGCAAA CAAAAAACC ACCGCTACCA
1681 GCGGTGTTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT TTCCGAAGGT AACTGGCTTC
1741 AGCAGAGCGC AGATACCAAA TACTGTCCTT CTAGTGTAGC CGTAGTTAGG CCACCACTTC
1801 AAGAACTCTG TAGCACC GCC TACATACCTC GCTCTGCTAA TCCTGTTACC AGTGGCTGCT
1861 GCCAGTGGCG ATAAGTCGTG TCTTACCGGG TTGGACTCAA GACGATAGTT ACCGGATAAG
1921 GCGCAGCGGT CGGGCTGAAC GGGGGGTTTCG TGCACACAGC CCAGCTTGGA GCGAACGACC
1981 TACACCGAAC TGAGATACCT ACAGCGTGAG CATTGAGAAA GCGCCACGCT TCCCGAAGGG
2041 AGAAAGGCGG ACAGGTATCC GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG CACGAGGGAG
2101 CTTCCAGGGG GAAACGCCTG GTATCTTTAT AGTCCTGTCG GGTTCGCCA CCTCTGACTT
2161 GAGCGTCGAT TTTTGTGATG CTCGTCAGGG GGGCGGAGCC TATGGAAAAA CGCCAGCAAC
2221 GCGGCCTTTT TACGGTTCCT GGCCTTTTGC TGGCCTTTTG CTCACATGTT CTTTCTGCG
2281 TTATCCCCTG ATTCTGTGGA TAACCGTATT ACCGCCTTTG AGTGAGCTGA TACCGCTCGC
2341 CGCAGCCGAA CGACCGAGCG CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA GCGCCTGATG
2401 CGGTATTTTC TCCTTACGCA TCTGTGCGGT ATTTACACAC GCAGACCAGC CGCGTAACCT
2461 GGCAAAATCG GTTACGGTTG AGTAATAAAT GGATGCCCTG CGTAAGCGGG TGTGGGCGGA-

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Figure 38B

Figure 39A:

DEST19

FastBac Transfer Vector with 39K Baculovirus Promoter

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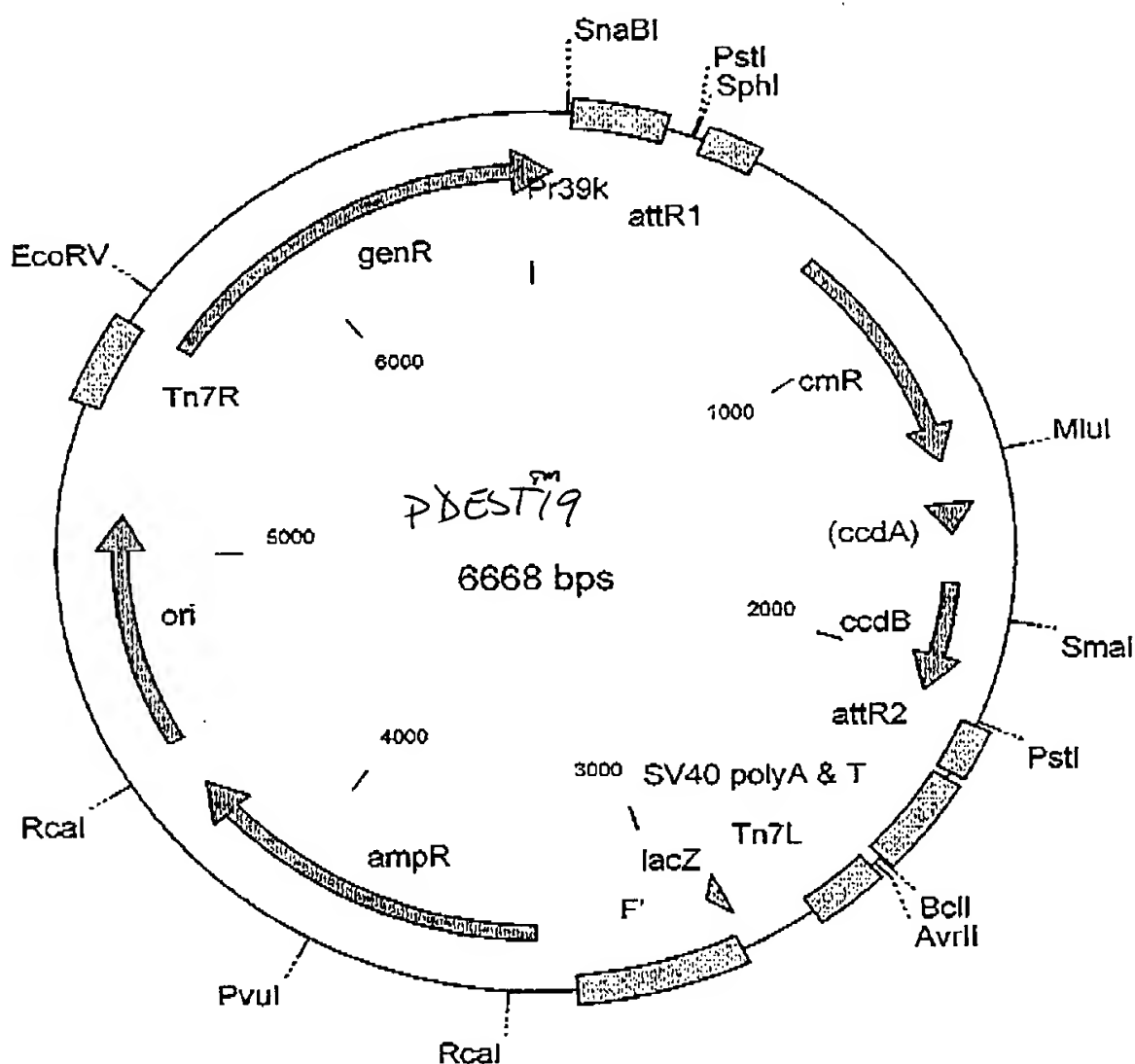
1  ggtgacgccg tcattcttcc attgtaacgt aaatggcaac ttgtagatga acgcgctgtc
   ccactgcggc agtagaaagg taacattgca tttaccgttg aacatctact tgcgcgacag

61  aaaaaaccgg ccagtttctt ccacaaactc ggcacgggct gtctcgtaaa cttttgcgtc
   ttttttgccc ggtcaaagaa ggtgtttgag cgcgtgccga cagagcattt gaaaacgcag

121 // gcaacaatcg cgatgacctc gtggtatgga aatttttctt aaaaaagtgt cgttcattgtc //
   // cgttggttagc gctactggag caccatacct ttaaaaaaga ttttttcaca gcaagtacag //

181 // ggcggcggcg ttcgcgctcc ggtacgcgcg acgggcacac agcaggacag ccttgctcgg
   // ccgcccgcgc aagcgcgagg ccatgcgcgc tgcccgtgtg tcgtcctgtc ggaacaggcc

241 ctcgattatc ataaacaatc ctgcaggcat gcaagctgga tcatacaag ttgtacaaa
   gagctaatag tatttgtag gagtccgta cgttcgacct agtaggttc aaacatgttt
                                     attR1
                                     Int V
  
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pDEST19 6668 bp (rotated to position 1000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
515..391	attR1
765..1424	CmR
1544..1628	inactivated ccdA
1766..2071	ccdB
2112..2236	attR2
2852..2895	lacZ
3344..4319	ampR
4460..5114	ori
5608..52	genR

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1 AGTGGTTCGC ATCCTCGGTT TTCTGGAAGG CGAGCATCGT TTGTTGCCCC AGGACTCTAG
61 CTATAGTTCT AGTGGTTGGC TACGTATATC AAATACTTGT AGGTGACGCC GTCATCTTTC
121 CATTGTAACG TAAATGGCAA CTTGTAGATG AACGCGCTGT CAAAAAACCG GCCAGTTTCT
181 TCCACAAACT CGCGCACGGC TGTCTCGTAA ACTTTTGCGT CGCAACAATC GCGATGACCT
241 CGTGGTATGG AAATTTTTTTC TAAAAAAGTG TCGTTCATGT CGGCGGCGGG CGCGTTCGCG
301 CTCCGGTACG CGCGACGGGC ACACAGCAGG ACAGCCTTGT CCGGCTCGAT TATCATAAAC
361 AATCCTGCAG GCATGCAAGC TCGGATCATC ACAAGTTTGT AAAAAAAGC TGAACGAGAA
421 ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA ACAGACTACA
481 TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCTAAGTTG GCAGCATCAC
541 CCGACGCACT TTGCGCCGAA TAAATACCTG TGACGGAAGA TCACTTCGCA GAATAAATAA
601 ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC CCTGGGCCAA CTTTGTGGCA AAATGAGACG
661 TTGATCGGCA CGTAAGAGGT TCCAAC TTTC ACCATAATGA AATAAGATCA CTACCGGGCG
721 TATTTTTTGA GTTATCGAGA TTTTCAGGAG CTAAGGAAGC TAAAATGGAG AAAAAAATCA
781 CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA AGAACATTTT GAGGCATTTT
841 AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT GGATATTACG GCCTTTTTTA
901 AGACCGTAAA GAAAAATAAG CACAAGTTT ATCCGGCCTT TATTCACATT CTTGCCCGCC
961 TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA CGGTGAGCTG GTGATATGGG
1021 ATAGTGTTCA CCCTTGTTAC ACCGTTTTTC ATGAGCAAAC TGAAACGTTT TCATCGCTCT
1081 GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT ATATTGCAA GATGTGGCGT
1141 GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT TGAGAATATG TTTTTCGTCT
1201 CAGCCAATCC CTGGGTGAGT TTCACCAGTT TTGATTTAAA CGTGGCCAAT ATGGACAAC
1261 TCTTCGCCCC CGTTTTTCACC ATGGGCAAAT ATTATACGCA AGGCGACAAG GTGCTGATGC
1321 CGCTGGCGAT TCAGGTTTCAT CATGCCGTCT GTGATGGCTT CCATGTCGGC AGAATGCTTA
1381 ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC GTAAACGCGT GGATCCGGCT
1441 TACTAAAAGC CAGATAACAG TATGCGTATT TGCGCGCTGA TTTTTCGGT ATAAGAATAT
1501 ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT GCTATGAAGC AGCGTATTAC
1561 AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA TATATGATGT CAATATCTCC
1621 GGTCTGGTAA GCACAACCAT GCAGAATGAA GCCCGTCGTC TCGTGCCGA ACGCTGGAAA
1681 GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCCCGGTTTA TTGAAATGAA CGGCTCTTTT
1741 GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT TACACCTATA AAAGAGAGAG
1801 CCGTTATCGT CTGTTTGTGG ATGTACAGAG TGATATTATT GACACGCCCC GGCGACGGAT
1861 GGTGATCCCC CTGGCCAGTG CACGTCTGCT GTCAGATAAA GTCTCCCGTG AACTTTACCC
1921 GGTGGTGCAT ATCGGGGATG AAAGCTGGCG CATGATGACC ACCGATATGG CCAGTGTGCC
1981 GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA TCTCAGCCAC CGCGAAAATG ACATCAAAAA
2041 CGCCATTAAC CTGATGTTCT GGGGAATATA AATGTCAGGC TCCCTTATAC ACAGCCAGTC
2101 TGCAGGTCGA CCATAGTGAC TGGATATGTT GTGTTTTACA GTATTATGTA GTCTGTTTTT
2161 TATGCAAAAT CTAATTTAAT ATATTGATAT TTATATCATT TTACGTTTCT CGTTCAGCTT
2221 TCTTGTACAA AGTGGTGATC GAGAAGTACT AGAGGATCAT AATCAGCCAT ACCACATTTG
2281 TAGAGGTTTT ACTTGCTTTA AAAAACCTCC CACACCTCCC CCTGAACCTG AAACATAAAA
2341 TGAATGCAAT TGTTGTTGTT AACTTGTTTA TTGCAGCTTA TAATGGTTAC AAATAAAGCA
2401 ATAGCATCAC AAATTTTACA AATAAAGCAT TTTTTTCACT GCATTCTAGT TGTGGTTTGT
2461 CCAAACTCAT CAATGTATCT TATCATGTCT GGATCTGATC ACTGCTTGAG CCTAGGAGAT
2521 CCGAACCAGA TAAGTGAAAT CTAGTTCCAA ACTATTTTGT CATTTTAAAT TTTCGTATTA
2581 GCTTACGACG CTACACCCAG TTCCCATCTA TTTTGTCACT CTTCCCTAAA TAATCCTTAA-

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FIGURE 39B

2581 GAGATTTAAA GCTCTAAGGT AAATATAAAA TTTTAAAGTG TATAATGTGT TAAACTACTG
2641 ATTCTAATTG TTTGTGTATT TTAGATTCCA ACCTATGGAA CTGATGAATG GGAGCAGTGG
2701 TGGAAATGCCT TTAATGAGGA AAACCTGTTT TGCTCAGAAG AAATGCCATC TAGTGATGAT
2761 GAGGCTACTG CTGACTCTCA ACATTCTACT CCTCCAAAAA AGAAGAGAAA GGTAGAAGAC
2821 CCCAAGGACT TTCCTTCAGA ATTGCTAAGT TTTTGTAGTC ATGCTGTGTT TAGTAATAGA
2881 ACTCTTGCTT GCTTTGCTAT TTACACCACA AAGGAAAAAG CTGCACTGCT ATACAAGAAA
2941 ATTATGGAAA AATATTCTGT AACCTTTATA AGTAGGCATA ACAGTTATAA TCATAACATA
3001 CTGTTTTTTC TTAATCCACA CAGGCATAGA GTGTCTGCTA TTAATAACTA TGCTCAAAAA
3061 TTGTGTACCT TTAGCTTTTTT AATTTGTAAA GGGGTAAATA AGGAATATTT GATGTATAGT
3121 GCCTTGACTA GAGATCATAA TCAGCCATAC CACATTTGTA GAGGTTTTAC TTGCTTTAAA
3181 AAACCTCCCA CACCTCCCCC TGAACCTGAA ACATAAAATG AATGCAATTG TTGTTGTAA
3241 CTTGTTTATT GCAGCTTATA ATGGTTACAA ATAAAGCAAT AGCATCACAA ATTTACAAA
3301 TAAAGCATTT TTTTCACTGC ATTCTAGTTG TGGTTTGTCC AAATCATCA ATGTATCTTA
3361 TCATGTCTGG ATCCCCAGGA AGCTCCTCTG TGTCCTCATA AACCTAACC TCCTCTACTT
3421 GAGAGGACAT TCCAATCATA GGCTGCCCCAT CCACCTCTG TGTCTCTCTG TTAATTAGGT
3481 CACTTAACAA AAAGGAAATT GGGTAGGGGT TTTTCACAGA CCGCTTTCTA AGGGTAATTT
3541 TAAATATCT GGAAGTCCC TTCCACTGCT GTGTTCCAGA AGTGTGGTA AACAGCCCAC
3601 AAATGTCAAC AGCAGAAACA TACAAGCTGT CAGCTTTGCA CAAGGGCCCA ACACCTGCT
3661 CATCAAGAAG CACTGTGGTT GCTGTGTTAG TAATGTGCAA AACAGGAGGC ACATTTTCCC
3721 CACCTGTGTA GGTTCCAAAA TATCTAGTGT TTTTATTTT ACTTGATCA GGAACCCAGC
3781 ACTCCACTGG ATAAGCATT TTTGGGGTTA CAGTTTGAGC AGGATATTTG GTCCTGTAGT
3841 GACTGTCAAC TGTAGCATTT TTTGGGGTTA CAGTTTGAGC AGGATATTTG GTCCTGTAGT
3901 TTGCTAACAC ACCCTGCAGC TCCAAAGGTT CCCCACCAAC AGCAAAAAAA TGAAAATTTG
3961 ACCCTTGAAT GGGTTTTCCA GCACCATTTT CATGAGTTTT TTGTGTCCCT GAATGCAAGT
4021 TTAACATAGC AGTTACCCCA ATAACCTCAG TTTTAAACAGT AACAGCTTCC CACATCAAAA
4081 TATTTCCACA GGTTAAGTCC TCATTTAAAT TAGGCAAAGG AATTGCTCTA GAGCGGCCGC
4141 CACCGCGGTG GAGCTCCAAT TCGCCCTATA GTGAGTCGTA TTACGCGCGC TCACTGGCCG
4201 TCGTTTTACA ACGTCGTGAC TGGGAAAACC CTGGCGTTAC CCAACTTAAT CGCCTTGCAG
4261 CACATCCCCC TTTCGCCAGC TGGCGTAATA GCGAAGAGGC CCGCACCGAT CGCCCTTCCC
4321 AACAGTTGCG CAGCCTGAAT GGCGAATGGG ACGCGCCCTG TAGCGGCGCA TTAAGCGCGG
4381 CGGGTGTGGT GGTTACGCGC AGCGTGACCG CTACACTTGC CAGCGCCCTA GCGCCCGCTC
4441 CTTTCGCTTT CTTCCTTCC TTTCTCGCCA CGTTCGCCGG CTTTCCCCGT CAAGCTCTAA
4501 ATCGGGGGCT CCCTTTAGGG TTCCGATTTA GTGCTTTACG GCACCTCGAC CCCAAAAAAC
4561 TTGATTAGGG TGATGGTTCA CGTAGTGGGC CATCGCCCTG ATAGACGGTT TTTCGCCCTT
4621 TGACGTTGGA GTCCACGTTT TTTAATAGTG GACTCTTGTT CCAAACCTGGA ACAACACTCA
4681 ACCCTATCTC GGTCTATTCT TTTGATTTAT AAGGGATTTT GCCGATTTTC GCCTATTGGT
4741 TAAAAAATGA GCTGATTTAA CAAAAATTTA ACGCGAATTT TAACAAAATA TTAACGCTTA
4801 CAATTTAGGT GGCATTTTTC GGGGAAATGT GCGCGGAACC CCTATTTGTT TATTTTTCTA
4861 AATACATTCA AATATGTATC CGCTCATGAG ACAATAACCC TGATAAATGC TTCAATAATA
4921 TTGAAAAAGG AAGAGTATGA GTATTCAACA TTTCCGTGTC GCCCTTATTC CTTTTTTTGC
4981 GGCATTTTGC CTTCTGTTT TTGCTCACC AGAAACGCTG GTGAAAGTAA AAGATGCTGA
5041 AGATCAGTTG GGTGCACGAG TGGGTTACAT CGAACTGGAT CTCAACAGCG GTAAGATCCT
5101 TGAGAGTTTT CGCCCCGAAG AACGTTTTTC AATGATGAGC ACTTTTAAAG TTCTGCTATG
5161 TGGCGCGGTA TTATCCCGTA TTGACGCCGG GCAAGAGCAA CTCGGTCGCC GCATACACTA
5221 TTCTCAGAAT GACTTGGTTG AGTACTCACC AGTCACAGAA AAGCATCTTA CGGATGGCAT
5281 GACAGTAAGA GAATTATGCA GTGCTGCCAT AACCATGAGT GATAACACTG CGGCCAACTT
5341 ACTTCTGACA ACGATCGGAG GACCGAAGGA GCTAACCGCT TTTTTCGACA ACATGGGGGA
5401 TCATGTAAC CGCCTTGATC GTTGGGAACC GGAGCTGAAT GAAGCCATAC CAAACGACGA
5461 GCGTGACACC ACGATGCCTG TAGCAATGGC AACAACTGTT CGCAAACCTAT TAACTGGCGA
5521 ACTACTTACT CTAGCTTCCC GGCAACAATT AATAGACTGG ATGGAGGCGG ATAAAGTTGC
5581 AGGACCACTT CTGCGCTCGG CCCTTCCGGC TGGCTGGTTT ATTGCTGATA AATCTGGAGC
5641 CGGTGAGCGT GGGTCTCGCG GTATCATTGC AGCACTGGGG CCAGATGGTA AGCCCTCCCG
5701 TATCGTAGTT ATCTACACGA CGGGGAGTCA GGCAACTATG GATGAACGAA ATAGACAGAT
5761 CGCTGAGATA GGTGCCTCAC TGATTAAGCA TTGGTAACTG TCAGACCAAG TTTACTCATA
5821 TATACTTTAG ATTGATTTAA AACTTCATTT TTAATTTAAA AGGATCTAGG TGAAGATCCT
5881 TTTTGATAAT CTCATGACCA AAATCCCTTA ACGTGAGTTT TCGTTCCACT GAGCGTCAGA
5941 CCCCCTAGAA AAGATCAAAG GATCTTCTTG AGATCCTTTT TTTCTGCGCG TAATCTGCTG
6001 CTTGCAAACA AAAAAACCAC CGTACCAGC GGTGGTTTGT TTGCCGGATC AAGAGCTACC-

FIGURE 31C

6061	AACTCTTTTT	CCGAAGGTAA	CTGGCTTCAG	CAGAGCGCAG	ATACCAAATA	CTGTCCTTCT
6121	AGTGTAGCCG	TAGTTAGGCC	ACCACTTCAA	GAACTCTGTA	GCACCGCCTA	CATACCTCGC
6181	TCTGCTAATC	CTGTTACCAG	TGGCTGCTGC	CAGTGGCGAT	AAGTCGTGTC	TTACCGGGTT
6241	GGACTCAAGA	CGATAGTTAC	CGGATAAGGC	GCAGCGGTCG	GGCTGAACGG	GGGGTTCGTG
6301	CACACAGCCC	AGCTTGGAGC	GAACGACCTA	CACCGAACTG	AGATACCTAC	AGCGTGAGCT
6361	ATGAGAAAGC	GCCACGCTTC	CCGAAGGGAG	AAAGGCGGAC	AGGTATCCGG	TAAGCGGCAG
6421	GGTCGGAACA	GGAGAGCGCA	CGAGGGAGCT	TCCAGGGGGA	AACGCCTGGT	ATCTTTATAG
6481	TCCTGTCGGG	TTTCGCCACC	TCTGACTTGA	GCGTCGATTT	TTGTGATGCT	CGTCAGGGGG
6541	GCGGAGCCTA	TGGAAAAACG	CCAGCAACGC	GGCCTTTTTA	CGGTTCCCTG	CCTTTTGCTG
6601	GCCTTTTGCT	CACATGTTCT	TTCCTGCGTT	ATCCCCTGAT	TCTGTGGATA	ACCGTATTAC
6661	CGCCTTTGAG	TGAGCTGATA	CCGCTCGCCG	CAGCCGAACG	ACCGAGCGCA	GCGAGTCAGT
6721	GAGCGAGGAA	GCGGAAGAGC	GCCCAATACG	CAAACCGCCT	CTCCCCGCGC	GTTGGCCGAT
6781	TCATTAATGC	AGCTGGCACG	ACAGGTTTCC	CGACTGGAAA	GCGGGCAGTG	AGCGCAACGC
6841	AATTAATGTG	AGTTAGCTCA	CTCATTAGGC	ACCCCAGGCT	TTACACTTTA	TGCTTCCGGC
6901	TCGTATGTTG	TGTGGAATTG	TGAGCGGATA	ACAATTTTAC	ACAGGAAACA	GCTATGACCA
6961	TGATTACGCC	AAGCGCGCAA	TTAACCCTCA	CTAAAGGGAA	CAAAAGCTGG	GTACCGGGCC
7021	CCCCCT					

FIGURE 31D

Figure 32A: pDEST12.2 CMV Promoter for Eukaryotic Expression, SV40 Promoter/ori for G418 Resistance

307 acc gtc aga tcg cct gga gac gcc atc cac gct gtt ttg acc tcc ata gaa
tgg cag tct agc gga cct ctg cgg tag gtg cga caa aac tgg agg tat ctt

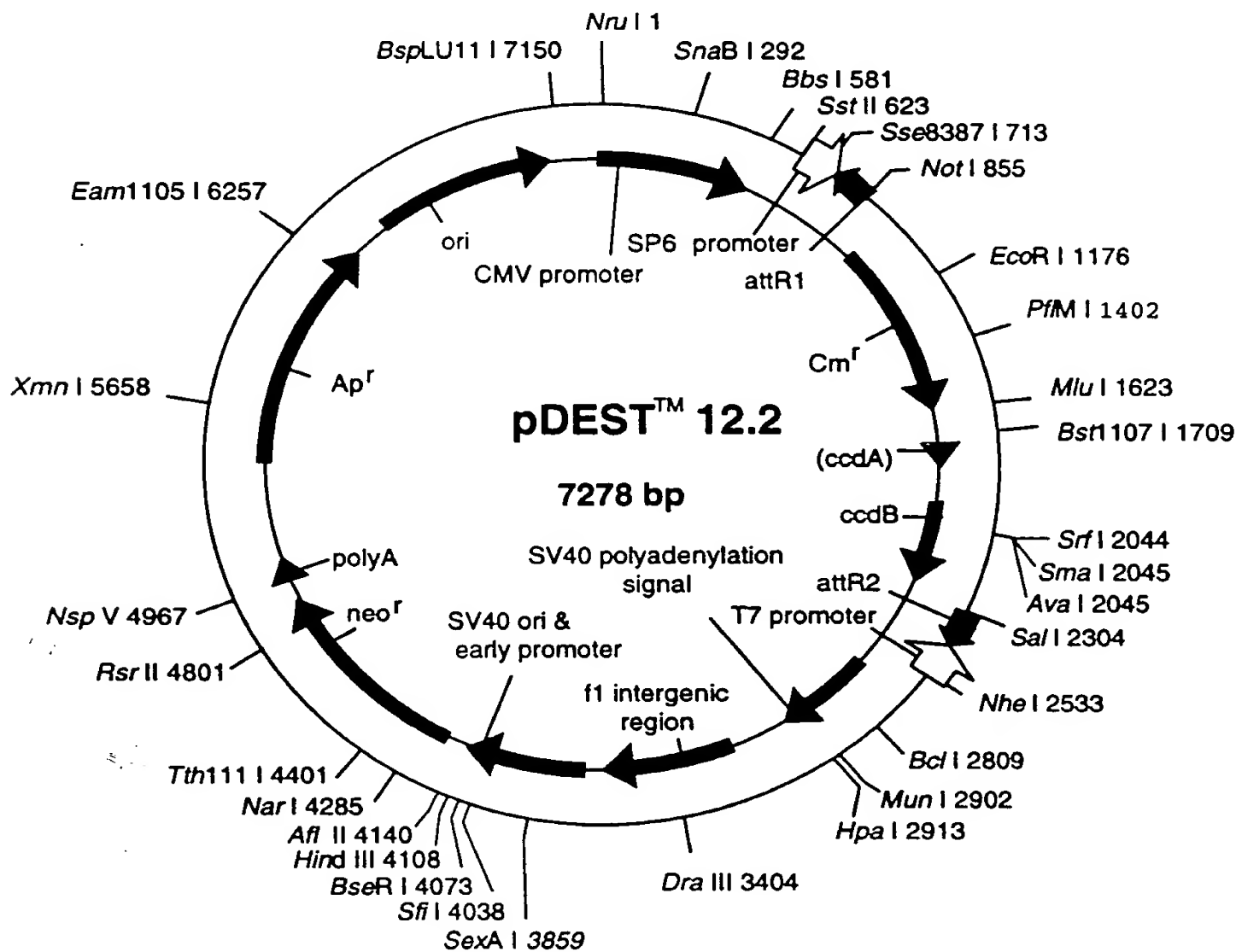
358 gac acc ggg acc gat cca gcc tcc gga ctc tag cct agg ccg cgg agc gga
ctg tgg ccc tgg cta ggt cgg agg cct gag atc gga tcc ggc gcc tcg cct

409 taa caa ttt cac aca gga aac agc tat gac cat tag gcc ttt gca aaa agc
att gtt aaa gtg tgt cct ttg tcg ata ctg gta atc cgg aaa cgt ttt tcg

460 tat tta ggt gac act ata gaa ggt acg cct gca ggt acc ggt ccg gaa ttc
ata aat cca ctg tga tat ctt cca tgc gga cgt cca tgg cca ggc ctt aag

511 cca tca aca agt ttg tao ada aaa gct gaa cga gaa acg taa aat gat ata
ggt agt tgt tca aac atg ttt ttc cga ctt gct ctt tgc att sta cta tat

mRNA from CMV promoter
Age
EcoRI
Int
attR1



pDEST12.2 7278 bp (rotated to position 3900)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
86..136	ori
220..742	CMV promoter
1059..935	attR1
1168..1827	CmR
1947..2031	inactivated ccdA
2169..2474	ccdB
2515..2639	attR2
2824..3186	small t & polyA
3310..3378	lac
4363..5157	neo
5680..6540	ampR

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1  GGGGGGCGGA GCCTATGGAA AAACGCCAGC AACGCGGCCT TTTTACGGTT CCTGGCCTTT
61 TGCTGGCCTT TTGCTCACAT GTTCTTTCCT GCGTTATCCC CTGATTCTGT GGATAACCGT
121 ATTACCGCCT TTGAGTGAGC TGATAACCGCT CGCCGCAGCC GAACGACCGA GCGCAGCGAG
181 TCAGTGAGCG AGGAAGCGGA AGAGCTCGCG AATGCATGTC GTTACATAAC TTACGGTAAA
241 TGGCCCGCCT GGCTGACCGC CCAACGACCC CCGCCCATTG ACGTCAATAA TGACGTATGT
301 TCCCATAGTA ACGCCAATAG GGACTTTCCTA TTGACGTCAA TGGGTGGAGT ATTTACGGTA
361 AACTGCCAC TTGGCAGTAC ATCAAGTGTA TCATATGCCA AGTACGCCCC CTATTGACGT
421 CAATGACGGT AAATGGCCCG CCTGGCATTG TGCCAGTAC ATGACCTTAT GGGACTTTC
481 TACTTGGCAG TACATCTACG TATTAGTCAT CGCTATTACC ATGGTGATGC GGTTTTGGCA
541 GTACATCAAT GGGCGTGGAT AGCGGTTTGA CTCACGGGGA TTTCCAAGTC TCCACCCCAT
601 TGACGTCAAT GGGAGTTTGT TTTGGCACCA AAATCAACGG GACTTTCCTA AATGTCGTAA
661 CAACTCCGCC CCATTGACGC AAATGGGCGG TAGGCGTGTA CGGTGGGAGG TCTATATAAG
721 CAGAGCTCGT TTAGTGAACC GTCAGATCGC CTGGAGACGC CATCCACGCT GTTTTGACCT
781 CCATAGAAGA CACCGGGACC GATCCAGCCT CCGGACTCTA GCCTAGGCCG CGGGACGGAT
841 AACAAATTCA CACAGGAAAC AGCTATGACC ATTAGGCCTT TGCAAAAAGC TATTTAGGTG
901 AACTATAGA AGGTACGCCT GCAGGTACCG GATCACAAGT TTGTACAAA AAGCTGAACG
961 AGAAACGTAA AATGATATAA ATATCAATAT ATTAATTAG ATTTTGCATA AAAAACAGAC
1021 TACATAATAC TGTAACACAC AACATATCCA GTCATATGG CGGCCGCATT AGGCACCCCA
1081 GGCTTTACAC TTTATGCTTC CGGCTCGTAT AATGTGTGGA TTTTGAGTTA GGATCCGTCG
1141 AGATTTTCAG GAGCTAAGGA AGCTAAAATG GAGAAAAAAA TCACTGGATA TACCACCGTT
1201 GATATATCCC AATGGCATCG TAAAGAACAT TTTGAGGCAT TTCAGTCAGT TGCTCAATGT
1261 ACCTATAACC AGACCGTTCA GCTGGATATT ACGGCCTTTT TAAAGACCGT AAAGAAAAAT
1321 AAGCACAAGT TTTATCCGGC CTTTATTCAC ATTCTTGCCC GCCTGATGAA TGCTCATCCG
1381 GAATTCCGTA TGGCAATGAA AGACGGTGAG CTGGTGATAT GGGATAGTGT TCACCCTTGT
1441 TACACCGTTT TCCATGAGCA AACTGAAACG TTTTCATCGC TCTGGAGTGA ATACCACGAC
1501 GATTTCCGGC AGTTTCTACA CATATATTCG CAAGATGTGG CGTGTTACGG TGAAAACCTG
1561 GCCTATTTCC CTAAAGGGTT TATTGAGAAT ATGTTTTTCG TCTCAGCCAA TCCCTGGGTG
1621 AGTTTCACCA GTTTTGATTT AAACGTGGCC AATATGGACA ACTTCTTCGC CCCCCTTTTC
1681 ACCATGGGCA AATATTATAC GCAAGGCGAC AAGGTGCTGA TGCCGCTGGC GATTCAGGTT
1741 CATCATGCCG TCTGTGATGG CTTCCATGTC GGCAGAATGC TTAATGAATT ACAACAGTAC
1801 TGCGATGAGT GGCAGGGCGG GCGGTAAACG CGTGGATCCG GCTTACTAAA AGCCAGATAA
1861 CAGTATGCGT ATTTGCGCGC TGATTTTTGC GGTATAAGAA TATATACTGA TATGTATACC
1921 CGAAGTATGT CAAAAGAGG TGTGCTATGA AGCAGCGTAT TACAGTGACA GTTGACAGCG
1981 ACAGCTATCA GTTGCTCAAG GCATATATGA TGTCAATATC TCCGGTCTGG TAAGCACAAC
2041 CATGCAGAAT GAAGCCCGTC GTCTGCGTGC CGAACGCTGG AAAGCGGAAA ATCAGGAAGG
2101 GATGGCTGAG GTCGCCCGGT TTATTGAAAT GAACGGCTCT TTTGCTGACG AGAACAGGGA
2161 CTGGTGAAAT GCAGTTTAAG GTTTACACCT ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG
2221 TGGATGTACA GAGTGATATT ATTGACACGC CCGGGCGACG GATGGTGATC CCCCTGGCCA
2281 GTGCACGTCT GCTGTCAGAT AAAGTCTCCC GTGAACTTTA CCCGGTGGTG CATATCGGGG
2341 ATGAAAGCTG GCGCATGATG ACCACCGATA TGGCCAGTGT GCCGGTCTCC GTTATCGGGG
2401 AAGAAGTGGC TGATCTCAGC CACCGCGAAA ATGACATCAA AAACGCCATT AACCTGATGT-

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FIGURE 32B

2461 TCTGGGGAAT ATAAATGTCA GGCTCCCTTA TACACAGCCA GTCTGCAGGT CGACCATAGT
2521 GACTGGATAT GTTGTGTTTT ACAGTATTAT GTAGTCTGTT TTTTATGCAA AATCTAATTT
2581 AATATATTGA TATTTATATC ATTTTACGTT TCTCGTTCAG CTTTCTTGTA CAAAGTGGTG
2641 ATCGCGTGCA TGCGACGTCA TAGCTCTCTC CCTATAGTGA GTCGTATTAT AAGCTAGGCA
2701 CTGGCCGTCG TTTTACAACG TCGTGACTGG GAAAACTGCT AGCTTGGGAT CTTTGTGAAG
2761 GAACCTTACT TCTGTGGTGT GACATAATTG GACAAACTAC CTACAGAGAT TTAAAGCTCT
2821 AAGGTAAATA TAAAATTTTT AAGTGTATAA TGTGTTAAAC TAGCTGCATA TGCTTGCTGC
2881 TTGAGAGTTT TGCTTACTGA GTATGATTTA TGAAAATATT ATACACAGGA GCTAGTGATT
2941 CTAATTGTTT GTGTATTTTA GATTCACAGT CCCAAGGCTC ATTTTCAGGCC CCTCAGTCCT
3001 CACAGTCTGT TCATGATCAT AATCAGCCAT ACCACATTTG TAGAGGTTTT ACTTGCTTTA
3061 AAAAACCTCC CACACCTCCC CCTGAACCTG AAACATAAAA TGAATGCAAT TGTGTGTGTT
3121 AACTTGTTTA TTGCAGCTTA TAATGGTTAC AAATAAAGCA ATAGCATCAC AAATTTTACA
3181 AATAAAGCAT TTTTTTCACT GCATTCTAGT TGTGGTTTTG CCAAACCTCAT CAATGTATCT
3241 TATCATGTCT GGATCGATCC TGCATTAATG AATCGGCCAA CGCGCGGGGA GAGGCGGTTT
3301 GCGTATTGGC TGGCGTAATA GCGAAGAGGC CCGCACCGAT CGCCCTTCCC AACAGTTGCG
3361 CAGCCTGAAT GCGGAATGGG ACGCGCCCTG TAGCGGCGCA TTAAGCGCGG CGGGTGTGGT
3421 GGTACGCGC AGCGTGACCG CTACACTTGC CAGCGCCCTA GCGCCCGCTC CTTTCGCTTT
3481 CTTCCCTTCC TTTCTCGCCA CGTTCGCCGG CTTTCCCCGT CAAGCTCTAA ATCGGGGGCT
3541 CCCTTTAGGG TTCCGATTTA GTGCTTTACG GCACCTCGAC CCCAAAAAAC TTGATTAGGG
3601 TGATGGTTCA CGTAGTGGGC CATCGCCCTG ATAGACGGTT TTTTCGCCCT TGACGTTGGA
3661 GTCCACGTTT TTTAATAGTG GACTCTTGTT CCAAACCTGA ACAACACTCA ACCCTATCTC
3721 GGTCTATTCT TTTGATTTAT AAGGGATTTT GCCGATTTTC GCCTATTGGT TAAAAAATGA
3781 GCTGATTTAA CAAATATTTA ACGCGAATTT TAACAAAATA TTAACGTTTA CAATTTTCGCC
3841 TGATGCGGTA TTTTCTCCTT ACGCATCTGT GCGGTATTTT ACACCGCATA CGCGGATCTG
3901 CGCAGCACCA TGGCCTGAAA TAACCTCTGA AAGAGGAACT TGGTTAGGTA CCTTCTGAGG
3961 CGGAAAGAAC CAGCTGTGGA ATGTGTGTCA GTTAGGGTGT GGAAAGTCCC CAGGCTCCCC
4021 AGCAGGCAGA AGTATGCAAA GCATGCATCT CAATTAGTCA GCAACCAGGT GTGGAAAGTC
4081 CCCAGGCTCC CCAGCAGGCA GAAGTATGCA AAGCATGCAT CTCAATTAGT CAGCAACCAT
4141 AGTCCCGCCC CTAACCTCCG CCATCCCGCC CCTAACTCCG CCCAGTTCCG CCCATTCTCC
4201 GCCCCATGGC TGAATAATTT TTTTATTTA TGCAGAGGCC GAGGCCGCCT CGGCCTCTGA
4261 GCTATTCCAG AAGTAGTGAG GAGGCTTTTT TGGAGGCCTA GGCTTTTGCA AAAAGCTTGA
4321 TTCTTCTGAC ACAACAGTCT CGAACTTAAG GCTAGAGCCA CCATGATTGA ACAAGATGGA
4381 TTGCACGCAG GTTCTCCGGC CGCTTGGGTG GAGAGGCTAT TCGGCTATGA CTGGGCACAA
4441 CAGACAATCG GCTGCTCTGA TGCCGCCGTG TTCCGGCTGT CAGCGCAGGG GCGCCCGGTT
4501 CTTTTTGTCA AGACCGACCT GTCCGGTGCC CTGAATGAAC TGCAGGACGA GGCAGCGCGG
4561 CTATCGTGCG TGGCCACGAC GGGCGTTTCT TGCGCAGCTG TGCTCGACGT TGTCACTGAA
4621 GCGGGAAGGG ACTGGCTGCT ATTGGGCGAA GTGCCGGGGC AGGATCTCCT GTCATCTCAC
4681 CTTGCTCCTG CCGAGAAAGT ATCCATCATG GCTGATGCAA TGCGGCGGCT GCATACGCTT
4741 GATCCGGCTA CCTGCCCATT CGACCACCAA GCGAAACATC GCATCGAGCG AGCACGTACT
4801 CGGATGGAAG CCGGTCTTGT CGATCAGGAT GATCTGGACG AAGAGCATCA GGGGCTCGCG
4861 CCAGCCGAAC TGTTCGCCAG GCTCAAGGCG CGCATGCCCC ACGGCGAGGA TCTCGTCGTG
4921 ACCCATGGCG ATGCCTGCTT GCCGAATATC ATGGTGGAAG ATGGCCGCTT TTCTGGATTC
4981 ATCGACTGTG GCCGGCTGGG TGTGGCGGAC CGCTATCAGG ACATAGCGTT GGCTACCCGT
5041 GATATTGCTG AAGAGCTTGG CGGCGAATGG GCTGACCGCT TCCTCGTGCT TTACGGTATC
5101 GCCGCTCCCG ATTCGCAGCG CATCGCCTTC TATCGCCTTC TTGACGAGTT CTTCTGAGCG
5161 GGAATCTGGG GTTCGAAATG ACCGACCAAG CGACGCCCAA CCTGCCATCA CGATGGCCGC
5221 AATAAAATAT CTTTATTTTC ATTACATCTG TGTGTTGGTT TTTTGTGTGA ATCGATAGCG
5281 ATAAGGATCC GCGTATGGTG CACTCTCAGT ACAATCTGCT CTGATGCCGC ATAGTTAAGC
5341 CAGCCCCGAC ACCCGCCAAC ACCCGCTGAC GCGCCCTGAC GGGCTTGTCT GCTCCCGGCA
5401 TCCGCTTACA GACAAGCTGT GACCGTCTCC GGGAGCTGCA TGTGTCAGAG GTTTTCACCG
5461 TCATCACCAG AACGCGCGAG ACGAAAGGGC CTCGTGATAC GCCTATTTTT ATAGGTTAAT
5521 GTCATGATAA TAATGGTTTC TTAGACGTCA GGTGGCACTT TTCGGGGAAA TGTGCGCGGA
5581 ACCCCTATTT GTTTATTTTT CTAAATACAT TCAAATATGT ATCCGCTCAT GAGACAATAA
5641 CCCTGATAAA TGCTTCAATA ATATTGAAAA AGGAAGAGTA TGAGTATTCA ACATTTCCGT
5701 GTCGCCCTTA TTCCCTTTTT TGCGGCATTT TGCCTTCCTG TTTTGTGCTA CCCAGAAACG
5761 CTGGTGAAAG TAAAAGATGC TGAAGATCAG TTGGGTGCAC GAGTGGGTTA CATCGAACTG
5821 GATCTCAACA GCGGTAAGAT CCTTGAGAGT TTTTCGCCCC AAGAACGTTT TCCAATGATG
5881 AGCACTTTTA AAGTTCTGCT ATGTGGCGCG GTATTATCCC GTATTGACGC CGGGCAAGAG-

Figure 32c

Figure 40A: pDEST20 Glutathione-S-transferase Fusion with Polyhedron Promoter for Baculovirus Expression

430 ggc tac gta tac tcc gga ata tta ata gat cat gga gat aat taa aat gat
ccg atg cat atg agg cct tat aat tat cta gta cct cta tta att tta cta

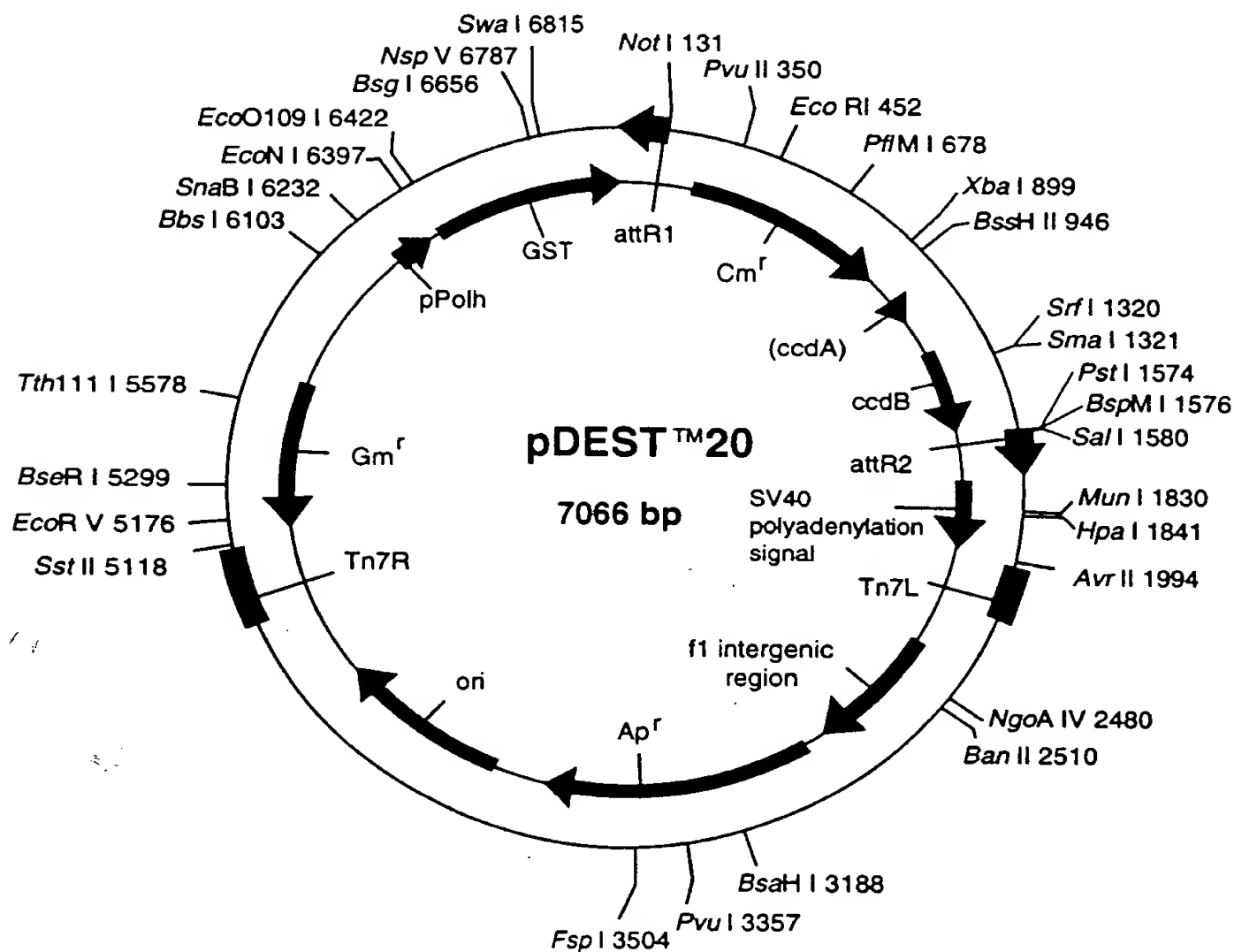
481 aac cat ctc gca aat aaa taa gta ttt tac tgt ttt cgt aac agt ttt gta
ttg gta gag cgt tta ttt att cat aaa atg aca aaa gca ttg tca aaa cat

532 ata aaa aaa cct ata aat att ccg gat tat tca tac cgt ccc acc atc ggg
tat ttt ttt gga tat tta taa ggc cta ata agt atg gca ggg tgg tag ccc

Start Transl. mRNA → A P T - - - - GST- -
583 cgc gga tcc atg gcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg
gcg cct agg tac cgg gga tat gat cca ata acc ttt taa ttc ccg gaa cac

1246 S D L V P R H N Q T S L Y K K A
tcg gat ctg gtt ccg cgt cat aat caa aca agt ttg tac aaa aaa gct gaa
agc cta gac caa ggc gca gta tta gtt tgt tca aac atg ttt ttt cga ctt

1297 cga gaa acg taa aat gat ata aat atc aat ata tta aat tag at
gct ctt tgc att tta cta tat tta tag tta tat aat tta atc ta



pDEST20 7066 bp (rotated to position 5800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
592..1263	GST
1397..1273	attR1
1506..2165	CmR
2285..2369	inactivated ccdA
2507..2812	ccdB
2853..2977	attR2
4214..5064	ampR
5263..5843	ori

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1  CCACTGCGCC GTTACCACCG CTGCGTTCGG TCAAGGTTCT GGACCAGTTG CGTGAGCGCA
61 TACGCTACTT GCATTACAGT TTACGAACCG AACAGGCTTA TGTCAACTGG GTTCGTGCCT
121 TCATCCGTTT CCACGGTGTG CGTCACCCGG CAACCTTGGG CAGCAGCGAA GTCGAGGCAT
181 TTCTGTCCTG GCTGGCGAAC GAGCGCAAGG TTTCGGTCTC CACGCATCGT CAGGCATTGG
241 CGGCCTTGCT GTTCTTCTAC GGCAAGGTGC TGTGCACGGA TCTGCCCTGG CTTCAGGAGA
301 TCGGAAGACC TCGGCCGTCG CGGCGCTTGC CGGTGGTGCT GACCCCGGAT GAAGTGGTTC
361 GCATCCTCGG TTTTCTGGAA GGCGAGCATC GTTTGTTCGC CCAGGACTCT AGCTATAGTT
421 CTAGTGTTTG GCTACGTATA CTCCGGAATA TTAATAGATC ATGGAGATAA TTAAATGAT
481 AACCATCTCG CAAATAAATA AGTATTTTAC TGTTTTCGTA ACAGTTTTGT AATAAAAAAA
541 CCTATAAATA TTCCGGATTA TTCATACCGT CCCACCATCG GGCGCGGATC CATGGCCCCCT
601 ATACTAGGTT ATTGGAAAAT TAAGGGCCTT GTGCAACCCA CTCGACTTCT TTTGGAATAT
661 CTTGAAGAAA AATATGAAGA GCATTTGTAT GAGCGCGATG AAGGTGATAA ATGGCGAAAC
721 AAAAAGTTTG AATTGGGTTT GGAGTTTCCC AATCTTCCTT ATTATATTGA TGGTGATGTT
781 AAATTAACAC AGTCTATGGC CATCATACGT TATATAGCTG ACAAGCACAA CATGTTGGGT
841 GGTTGTCCAA AAGAGCGTGC AGAGATTTCA ATGCTTGAAG GAGCGGTTTT GGATATTAGA
901 TACGGTGTTT CGAGAATTGC ATATAGTAAA GACTTTGAAA CTCTCAAAGT TGATTTTCTT
961 AGCAAGCTAC CTGAAATGCT GAAAATGTTC GAAGATCGTT TATGTCATAA AACATATTTA
1021 AATGGTGATC ATGTAACCCA TCCTGACTTC ATGTTGTATG ACGCTCTTGA TGTGTTTTTA
1081 TACATGGACC CAATGTGCCT GGATGCGTTC CCAAATTAG TTTGTTTTAA AAAACGTATT
1141 GAAGCTATCC CACAAATTGA TAAGTACTTG AAATCCAGCA AGTATATAGC ATGGCCTTTG
1201 CAGGGCTGGC AAGCCACGTT TGGTGGTGGC GACCATCCTC CAAAATCGGA TCTGGTTCGG
1261 CGTCATAATC AAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT
1321 ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAAACACAA
1381 CATATCCAGT CACTATGGCG GCCGCATTAG GCACCCAGG CTTTACACTT TATGCTTCCG
1441 GCTCGTATGT TGTGTGGATT TTGAGTTAGG ATCCGGCGAG ATTTTCAGGA GCTAAGGAAG
1501 CTAAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA TATATCCCAA TGGCATCGTA
1561 AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC CTATAACCAG ACCGTTCAGC
1621 TGGATATTAC GGCCTTTTTTA AAGACCGTAA AGAAAAATAA GCACAAGTTT TATCCGGCCT
1681 TTATTCACAT TCTTGCCCGC CTGATGAATG CTCATCCGGA ATTCCGTATG GCAATGAAAG
1741 ACGGTGAGCT GGTGATATGG GATAGTGTTT ACCCTTGTTA CACCGTTTTT CATGAGCAAA
1801 CTGAAACGTT TTCATCGCTC TGGAGTGAAT ACCACGACGA TTTCGGCAG TTTCTACACA
1861 TATATTCGCA AGATGTGGCG TGTTACGGTG AAAACCTGGC CTATTTCCCT AAAGGGTTTA
1921 TTGAGAATAT GTTTTTTCGTC TCAGCCAATC CCTGGGTGAG TTTCACCACT TTTGATTTAA
1981 ACGTGGCCAA TATGGACAAC TTCTTCGCCC CCGTTTTTCAC CATGGGCAAA TATTATACGC
2041 AAGGCGACAA GGTGCTGATG CCGCTGGCGA TTCAGGTTCA TCATGCCGTC TGTGATGGCT
2101 TCCATGTCCG CAGAAATGCTT AATGAATTAC AACAGTACTG CGATGAGTGG CAGGGCGGGG
2161 CGTAATCTAG AGGATCCGGC TTAATAAAAG CCAGATAACA GTATGCGTAT TTGCGCGCTG
2221 ATTTTTGCGG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA AAAAGAGGTG
2281 TGCTATGAAG CAGCGTATTA CAGTGACAGT TGACAGCGAC AGCTATCAGT TGCTCAAGGC
2341 ATATATGATG TCAATATCTC CGGTCTGGTA AGCACAACCA TGCAGAATGA AGCCCGTCGT
2401 CTGCGTGCCG AACGCTGGAA AGCGGAAAT CAGGAAGGGA TGGCTGAGGT CGCCCGGTTT
2461 ATTGAAATGA ACGGCTCTTT TGCTGACGAG AACAGGGACT GGTGAAATGC AGTTTAAGGT
2521 TTACACCTAT AAAAGAGAGA GCCGTTATCG TCTGTTTGTG GATGTACAGA GTGATATTAT
2581 TGACACGCCC GGGCGACGGA TGGTGATCCC CCTGGCCAGT GCACGTCTGC TGTCAGATAA
2641 AGTCTCCCGT GAACTTTACC CGGTGGTGCA TATCGGGGAT GAAAGCTGGC GCATGATGAC-

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Figure 40B

2701 CACCGATATG GCCAGTGTGC CGGTCTCCGT TATCGGGGAA GAAGTGGCTG ATCTCAGCCA
2761 CCGCGAAAAT GACATCAAAA ACGCCATTAA CCTGATGTTC TGGGGAATAT AAATGTCAGG
2821 CTCCCTTATA CACAGCCAGT CTGCAGGTCG ACCATAGTGA CTGGATATGT TGTGTTTTAC
2881 AGTATTATGT AGTCTGTTTT TTATGCAAAA TCTAATTTAA TATATTGATA TTTATATCAT
2941 TTTACGTTTC TCGTTCAGCT TTCTTGTACA AAGTGGTTTG ATAGCTTGTC GAGAAGTACT
3001 AGAGGATCAT AATCAGCCAT ACCACATTTG TAGAGGTTTT ACTTGCTTTA AAAAACCTCC
3061 CACACCTCCC CCTGAACCTG AAACATAAAA TGAATGCAAT TGTGTTGTTT AACTTGTTTA
3121 TTGCAGCTTA TAATGGTTAC AAATAAAGCA ATAGCATCAC AAATTTTACA AATAAAGCAT
3181 TTTTTTCACT GCATTCTAGT TGTGGTTTGT CCAAACATCAT CAATGTATCT TATCATGTCT
3241 GGATCTGATC ACTGCTTGAG CCTAGGAGAT CCGAACCAGA TAAGTGAAAT CTAGTTCCAA
3301 ACTATTTTGT CATTTTAAAT TTTCGTATTA GCTTACGACG CTACACCCAG TTCCCATCTA
3361 TTTTGTCACT CTTCCCTAAA TAATCCTTAA AAACCTCCATT TCCACCCCTC CCAGTTCCCA
3421 ACTATTTTGT CCGCCACAG CGGGGCATTT TTCTTCCTGT TATGTTTTTA ATCAAACATC
3481 CTGCCAACTC CATGTGACAA ACCGTCATCT TCGGCTACTT TTTCTCTGTC ACAGAATGAA
3541 AATTTTTCTG TCATCTCTTC GTTATTAATG TTTGTAATTG ACTGAATATC AACGCTTATT
3601 TGCAGCCTGA ATGGCGAATG GACGCGCCCT GTAGCGGCGC ATTAAGCGCG GCGGGTGTGG
3661 TGGTTACGCG CAGCGTGACC GCTACACTTG CCAGCGCCCT AGCGCCCGCT CCTTTCGCTT
3721 TCTTCCCTTC CTTTCTCGCC ACGTTCGCCG GCTTTCCTCG TCAAGCTCTA AATCGGGGGC
3781 TCCCTTTAGG GTTCCGATTT AGTGCTTTAC GGCACCTCGA CCCCCAAAAA CTTGATTAGG
3841 GTGATGGTTC ACGTAGTGGG CCATCGCCCT GATAGACGGT TTTTCGCCCT TTGACGTTGG
3901 AGTCCACGTT CTTTAATAGT GGACTCTTGT TCCAAACTGG AACAACTCTC AACCCATATCT
3961 CGGTCTATTC TTTTGATTTA TAAGGGATTT TGCCGATTTT GGCCTATTGG TTAAAAAATG
4021 AGCTGATTTA ACAAAAATTT AACGCGAATT TTAACAAAAT ATTAACGTTT ACAATTTTCA
4081 GTGGCACTTT TCGGGGAAAT GTGCGCGGAA CCCCTATTTG TTTATTTTTT TAAATACATT
4141 CAAATATGTA TCCGCTCATG AGACAATAAC CCTGATAAAT GCTTCAATAA TATTGAAAAA
4201 GGAAGAGTAT GAGTATTCAA CATTTCCGTG TCGCCCTTAT TCCCTTTTTT GCGGCATTTT
4261 GCCTTCCTGT TTTTGCTCAC CCAGAAACGC TGGTGAAAGT AAAAGATGCT GAAGATCAGT
4321 TGGGTGCACG AGTGGGTTAC ATCGAACTGG ATCTCAACAG CGGTAAGATC CTTGAGAGTT
4381 TTCGCCCCGA AGAACGTTTT CCAATGATGA GCACTTTTAA AGTTCTGCTA TGTGGCGCGG
4441 TATTATCCCG TATTGACGCC GGGCAAGAGC AACTCGGTCT CCGCATAAC TATTCTCAGA
4501 ATGACTTGGT TGAGTACTCA CCAGTCACAG AAAAGCATCT TACGGATGGC ATGACAGTAA
4561 GAGAATTATG CAGTGCTGCC ATAACCATGA GTGATAACAC TCGGGCCAAC TTACTTCTGA
4621 CAACGATCGG AGGACCGAAG GAGCTAACCG CTTTTTTTGA CAACATGGGG GATCATGTAA
4681 CTCGCCCTTGA TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA
4741 CCACGATGCC TGTAGCAATG GCAACAACGT TGCGCAAAC ATTAACCTGG GAACTACTTA
4801 CTCTAGCTTC CCGGCAACAA TTAATAGACT GGATGGAGGC GGATAAAGTT GCAGGACCAC
4861 TTCTGCGCTC GGCCCTTCCG GCTGGCTGGT TTATTGCTGA TAAATCTGGA GCCGGTGAGC
4921 GTGGGTCTCG CGGTATCATT GCAGCACTGG GGCCAGATGG TAAGCCCTCC CGTATCGTAG
4981 TTATCTACAC GACGGGGAGT CAGGCAACTA TGGATGAACG AAATAGACAG ATCGCTGAGA
5041 TAGGTGCCTC ACTGATTAAG CATTGGTAAC TGTCAGACCA AGTTTACTCA TATATACTTT
5101 AGATTGATTT AAAACTTCAT TTTTAATTTA AAAGGATCTA GGTGAAGATC CTTTTTGATA
5161 ATCTCATGAC CAAAATCCCT TAACGTGAGT TTTCTGTTCA CTGAGCGTCA GACCCCGTAG
5221 AAAAGATCAA AGGATCTTCT TGAGATCCTT TTTTCTGCG CGTAATCTGC TGCTTGCAAA
5281 CAAAAAACC ACCGCTACCA GCGGTGGTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT
5341 TTCCGAAGGT AACTGGCTTC AGCAGAGCGC AGATAACAAA TACTGTCCTT CTAGTGTAGC
5401 CGTAGTTAGG CCACCACTTC AAGAACTCTG TAGCACCACC TACATACCTC GCTCTGCTAA
5461 TCCTGTTACC AGTGGCTGCT GCCAGTGGCG ATAAGTCGTG TCTTACCGGG TTGGACTCAA
5521 GACGATAGTT ACCGGATAAG GCGCAGCGGT CGGGCTGAAC GGGGGGTTCT TGCACACAGC
5581 CCAGCTTGGA GCGAACGACC TACACCGAAC TGAGATACCT ACAGCGTGAG CATTGAGAAA
5641 GCGCCACGCT TCCCGAAGGG AGAAAGGCGG ACAGGTATCC GGTAAGCGGC AGGGTCGGAA
5701 CAGGAGAGCG CACGAGGGAG CTTCCAGGGG GAAACGCCTG GTATCTTTAT AGTCCTGTCG
5761 GGTTTCGCCA CCTCTGACTT GAGCGTCGAT TTTTGTGATG CTCGTCAGGG GGGCGGAGCC
5821 TATGGAAAAA CGCCAGCAAC GCGGCCTTTT TACGGTTTCT GGCCTTTTGC TGGCCTTTTG
5881 CTCACATGTT CTTTCCTGCG TTATCCCCTG ATTCTGTGGA TAACCGTATT ACCGCCTTTG
5941 AGTGAGCTGA TACCGCTCGC CGCAGCCGAA CGACCGAGCG CAGCGAGTCA GTGAGCGAGG
6001 AAGCGGAAGA GCGCCTGATG CGGTATTTTC TCCTTACGCA TCTGTGCGGT ATTTACACC
6061 GCAGACCAGC CGCGTAACCT GGCAAAATCG GTTACGGTTG AGTAATAAAT GGATGCCCTG
6121 CGTAAGCGGG TGTGGGCGGA CAATAAAGTC TTAAACTGAA CAAAATAGAT CTAAACTATG-

Figure 40C

6181	ACAATAAAGT	CTTAAACTAG	ACAGAATAGT	TGTAAACTGA	AATCAGTCCA	GTTATGCTGT
6241	GAAAAAGCAT	ACTGGACTTT	TGTTATGGCT	AAAGCAAAC	CTTCATTTTC	TGAAGTGCAA
6301	ATTGCCCCTC	GTATTAAAGA	GGGGCGTGGC	CAAGGGCATG	GTAAAGACTA	TATTCGCGGC
6361	GTTGTGACAA	TTTACCGAAC	AACTCCGCGG	CCGGGAAGCC	GATCTCGGCT	TGAACGAATT
6421	GTTAGGTGGC	GGTACTTGGG	TCGATATCAA	AGTGCATCAC	TTCTTCCCGT	ATGCCCAACT
6481	TTGTATAGAG	AGCCACTGCG	GGATCGTCAC	CGTAATCTGC	TTGCACGTAG	ATCACATAAG
6541	CACCAAGCGC	GTTGGCCTCA	TGCTTGAGGA	GATTGATGAG	CGCGGTGGCA	ATGCCCTGCC
6601	TCCGGTGCTC	GCCGGAGACT	GCGAGATCAT	AGATATAGAT	CTCACTACGC	GGCTGCTCAA
6661	ACCTGGGCAG	AACGTAAGCC	GCGAGAGCGC	CAACAACCGC	TTCTTGCTCG	AAGGCAGCAA
6721	GCGCGATGAA	TGTCTTACTA	CGGAGCAAGT	TCCCGAGGTA	ATCGGAGTCC	GGCTGATGTT
6781	GGGAGTAGGT	GGCTACGTCT	CCGAACTCAC	GACCGAAAAG	ATCAAGAGCA	GCCCGCATGG
6841	ATTTGACTTG	GTCAGGGCCG	AGCCTACATG	TGCGAATGAT	GCCCATACTT	GAGCCACCTA
6901	ACTTTGTTTT	AGGGCGACTG	CCCTGCTGCG	TAACATCGTT	GCTGCTGCGT	AACATCGTTG
6961	CTGCTCCATA	ACATCAAACA	TCGACCCACG	GCGTAACGCG	CTTGCTGCTT	GGATGCCCGA
7021	GGCATAGACT	GTACAAAAAA	ACAGTCATAA	CAAGCCATGA	AAACCG	

FIGURE 40D

Figure 41A:

pDEST21

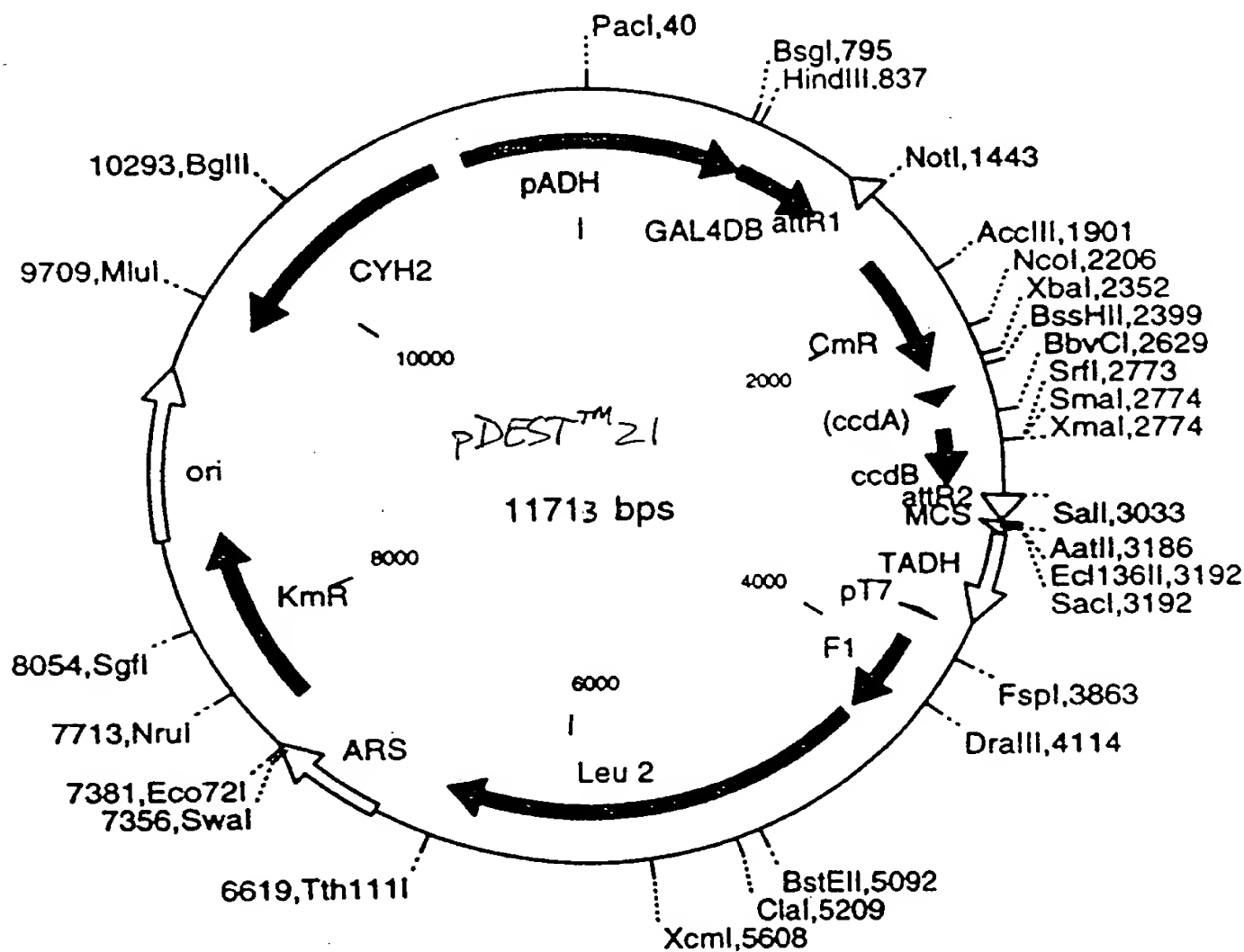
2-Hybrid Vector with DNA-Binding Domain

ADH Promoter

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700  ttg gcg ctg tgc tat caa gta taa ata gac ctg caa tta tta atc ttt tgt
    aac ggc gaa acg ata gtt cat att tat ctg gac gtt aat aat tag aaa aca
751  ttc ctc gtc att gtt ctc gtt ccc ttt ctt cct tgt ttc ttt ttc tgc aca
    aag gag cag taa caa gag caa ggg aaa gaa gga aca aag aaa aag acg tgt
802  ata ttt caa gct ata cca agc ata caa tca act cca agc ttg aag caa gcc
    tat aaa gtt cga tat ggt tgc tat gtt agt tga ggt tgc aac ttc gtt cgg
Start Transl M K L L S S Gal4-DB
853  tcc tga aag atg aag cta ctg tct tct atc gaa caa gca tgc gat att tgc
    agg act ttc tac ttc gat gac aga aga tag ctt gtt cgt acg cta taa acg
...
1261 gaa gag agt agt aac aaa ggt caa aga cag ttg act gta tgc tgc agg tgc
    ctt ctc tca tca ttg ttt cca gtt tct gtc aac tga cat agc agc tcc agc
1312 N Q T S L Y K K A att RI
    aat caa aca agt ttg tac aaa aaa gct gaa cga gaa acg taa aat gat ata
    tta gtt tgt tca aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat
    
```

Int ↓



pDEST21 11713 bp (rotated to position 11000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
857..1322	GAL4DB
1456..1332	attR1
1706..2365	CmR
2485..2569	inactivated ccdA
2707..3012	ccdB
3053..3177	attR2
3716..3735	pT7 (T7 promoter)
3899..4354	f1 (f1 intergenic region)
4414..6642	Leu2
7541..8515	kanR
9668..10958	CYH2
11118..848	pADH (ADH promoter)

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1 TTTATTATGT TACAATATGG AAGGGAACCTT TACACTTCTC CTATGCACAT ATATTAATTA
61 AAGTCCAATG CTAGTAGAGA AGGGGGGTAA CACCCCTCCG CGCTCTTTTC CGATTTTTTT
121 CTAAACCGTG GAATATTTTCG GATATCCTTT TGTGTGTTCC GGGTGTACAA TATGGACTTC
181 CTCTTTTCTG GCAACCAAAC CCATACATCG GGATTCCTAT AATACCTTCG TTGGTCTCCC
241 TAACATGTAG GTGGCGGAGG GGAGATATAC AATAGAACAG ATACCAGACA AGACATAATG
301 GGCTAAACAA GACTACACCA ATTACACTGC CTCATTGATG GTGGTACATA ACGAACTAAT
361 ACTGTAGCCC TAGACTTGAT AGCCATCATC ATATCGAAGT TTCACTACCC TTTTTCATT
421 TGCCATCTAT TGAAGTAATA ATAGGCGCAT GCAACTTCTT TTCTTTTTTT TTCTTTTCTC
481 TCTCCCCCGT TGTTGTCTCA CCATATCCGC AATGACAAAA AAAATGATGG AAGACACTAA
541 AGGAAAAAAT TAACGACAAA GACAGCACCA ACAGATGTCG TTGTTCCAGA GCTGATGAGG
601 GGTATCTTCG AACACACGAA ACTTTTTTCCT TCCTTCATTC ACGCACACTA CTCTCTAATG
661 AGCAACGGTA TACGGCCTTC CTTCCAGTTA CTTGAATTTG AAATAAAAAA AGTTTGCCGC
721 TTTGCTATCA AGTATAAATA GACCTGCAAT TATTAATCTT TTGTTTCCTC GTCATTGTTT
781 TCGTTCCCTT TCTTCCTTGT TTCTTTTTCT GCACAATATT TCAAGCTATA CCAAGCATA
841 AATCAACTCC AAGCTTGAAG CAAGCCTCCT GAAAGATGAA GCTACTGTCT TCTATCGAAC
901 AAGCATGCGA TATTTGCCGA CTTAAAAAGC TCAAGTGCTC CAAAGAAAAA CCGAAGTGCG
961 CCAAGTGTCT GAAGAACAAC TGGGAGTGTC GCTACTCTCC CAAAACCAA AGGTCTCCGC
1021 TGACTAGGGC ACATCTGACA GAAGTGGAAT CAAGGCTAGA AAGACTGGAA CAGCTATTTT
1081 TACTGATTTT TCCTCGAGAA GACCTTGACA TGATTTTGAA AATGGATTCT TTACAGGATA
1141 TAAAAGCATT GTTAACAGGA TTATTTGTAC AAGATAATGT GAATAAAGAT GCCGTCACAG
1201 ATAGATTGGC TTCAGTGGAG ACTGATATGC CTCTAACATT GAGACAGCAT AGAATAAGTG
1261 CGACATCATC ATCGGAAGAG AGTAGTAACA AAGGTCAAAG ACAGTTGACT GTATCGTCGA
1321 GGTCGAATCA AACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAAT GATATAAATA
1381 TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT AAAACACAAC
1441 ATATCCAGTC ACTATGGCGG CCGCTAAGTT GGCAGCATCA CCCGACGCAC TTTGCGCCGA
1501 ATAAATACCT GTGACGGAAG ATCACTTCGC AGAATAAATA AATCCTGGTG TCCCTGTTGA
1561 TACCGGGAAG CCCTGGGCCA ACTTTTGGCG AAAATGAGAC GTTGATCGGC ACGTAAGAGG
1621 TTCCAACCTT CACCATAATG AAATAAGATC ACTACCGGGC GTATTTTTTG AGTTATCGAG
1681 ATTTTCAGGA GCTAAGGAAG CTAAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA
1741 TATATCCCAA TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC
1801 CTATAACCAG ACCGTTTCAGC TGGATATTAC GGCCTTTTTTA AAGACCGTAA AGAAAAATAA
1861 GCACAAGTTT TATCCGGCCT TTATTCACAT TCTTGCCCGC CTGATGAATG CTCATCCGGA
1921 ATTCCGTATG GCAATGAAAG ACGGTGAGCT GGTGATATGG GATAGTGTTT ACCCTTGTTA
1981 CACCGTTTTT CATGAGCAAA CTGAAACGTT TTCATCGCTC TGGAGTGAAT ACCACGACGA
2041 TTTCCGGCAG TTTCTACACA TATATTTCGA AGATGTGGCG GTTACGGTG AAAACCTGGC
2101 CTATTTCCCT AAAGGGTTTA TTGAGAATAT GTTTTTTCGTC TCAGCCAATC CCTGGGTGAG
2161 TTTCACCAGT TTTGATTTAA ACGTGGCCAA TATGGACAAC TTCTTCGCCC CCGTTTTTCAC
2221 CATGGGCAAA TATTATACGC AAGGCGACAA GGTGCTGATG CCGCTGGCGA TTCAGGTTCA
2281 TCATGCCGTC TGTGATGGCT TCCATGTCTG CAGAATGCTT AATGAATTAC AACAGTACTG
2341 CGATGAGTGG CAGGGCGGGG CGTAATCTAG AGGATCCGGC TTACTAAAAG CCAGATAACA
2401 GTATGCGTAT TTGCGCGCTG ATTTTTCGCG TATAAGAATA TATACTGATA TGTATACCCG-

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FIGURE 41B

2461 AAGTATGTCA AAAAGAGGTG TGCTATGAAG CAGCGTATTA CAGTGACAGT TGACAGCGAC
2521 AGCTATCAGT TGCTCAAGGC ATATATGATG TCAATATCTC CGGTCTGGTA AGCACAACCA
2581 TGCAGAATGA AGCCCGTCGT CTGCGTGCCG AACGCTGGAA AGCGGAAAAT CAGGAAGGGA
2641 TGGCTGAGGT CGCCCGGTTT ATTGAAATGA ACGGCTCTTT TGCTGACGAG AACAGGGACT
2701 GGTGAAATGC AGTTTAAGGT TTACACCTAT AAAAGAGAGA GCCGTTATCG TCTGTTTGTG
2761 GATGTACAGA GTGATATTAT TGACACGCCC GGGCGACGGA TGGTGATCCC CCTGGCCAGT
2821 GCACGTCTGC TGTCAGATAA AGTCTCCCGT GAACTTTACC CGGTGGTGCA TATCGGGGAT
2881 GAAAGCTGGC GCATGATGAC CACCGATATG GCCAGTGTGC CGGTCTCCGT TATCGGGGAA
2941 GAAGTGGCTG ATCTCAGCCA CCGCGAAAAT GACATCAAAA ACGCCATTAA CCTGATGTTC
3001 TGGGGAATAT AAATGTCAGG CTCCCTTATA CACAGCCAGT CTGCAGGTCG ACCATAGTGA
3061 CTGGATATGT TGTGTTTTAC AGTATTATGT AGTCTGTTTT TTATGCAAAA TCTAATTTAA
3121 TATATTGATA TTTATATCAT TTTACGTTTC TCGTTCAGCT TTCTTGTAACA AAGTGGTTTG
3181 ATGGCCGCTA AGTAAGTAAG ACGTCGAGCT CTAAGTAAGT AACGGCCGCC ACCGCGGTGG
3241 AGCTTTGGAC TTCTTCGCCA GAGGTTTGGT CAAGTCTCCA ATCAAGGTTG TCGGCTTGTC
3301 TACCTTGCCA GAAATTTACG AAAAGATGGA AAAGGGTCAA ATCGTTGGTA GATACGTTGT
3361 TGACACTTCT AAATAAGCGA ATTTCTTATG ATTTATGATT TTTATTATTA AATAAGTTAT
3421 AAAAAAATA AGTGTATACA AATTTTAAAG TGACTCTTAG GTTTTAAAC GAAATTCCTT
3481 ATTCTTGAGT AACTCTTTCC TGTAGGTCAG GTTGCTTTCT CAGGTATAGC ATGAGGTCGC
3541 TCTTATTGAC CACACCTCTA CCGGCATGCC GAGCAAATGC CTGCAAATCG CTCCCCATTT
3601 CACCCAATTG TAGATATGCT AACTCCAGCA ATGAGTTGAT GAATCTCGGT GTGTATTTTA
3661 TGTCTCAGA GGACAATACC TGTGTGAATC GTTCTTCCAC ACGGATCCCA ATTCGCCCTA
3721 TAGTGAGTCG TATTACAATT CACTGGCCGT CGTTTTACAA CGTCGTGACT GGGAAAACCC
3781 TGGCGTTACC CAACTTAATC GCCTTGACG ACATCCCCCT TTCGCCAGCT GGC GTAATAG
3841 CGAAGAGGCC CGCACCGATC GCCCTTCCCA ACAGTTGCGC AGCCTGAATG GCGAATGGAC
3901 GCGCCCTGTA GCGGCGCATT AAGCGCGGCG GGTGTGGTGG TTACGCGCAG CGTGACCGCT
3961 AACTTGCCA GCGCCCTAGC GCCCGCTCCT TTCGCTTTCT TCCCTTCCTT TCTCGCCACG
4021 TTCGCCGGCT TTCCCCGTCA AGCTCTAAAT CGGGGGCTCC CTTTAGGGTT CCGATTTAGT
4081 GCTTTACGGC ACCTCGACCC CAAAAAATTT GATTAGGGTG ATGGTTCACG TAGTGGGCCA
4141 TCGCCCTGAT AGACGGTTTT TCGCCCTTTG ACGTTGGAGT CCACGTTCTT TAATAGTGGA
4201 CTCTTGTTCC AAAGTGAAC AACACTCAAC CCTATCTCGG TCTATTCTTT TGATTTATAA
4261 GGGATTTTGC CGATTTCCGG CTATTGGTTA AAAAATGAGC TGATTTAACA AAAATTTAAC
4321 GCGAATTTTA ACAAATATT AACGTTTACA ATTTCTTGAT GCGGTATTTT CTCCTTACGC
4381 ATCTGTGCGG TATTTACACAC CGCATATCGA CCGGTCGAGG AGAACTTCTA GTATATCCAC
4441 ATACCTAATA TTATTGCCTT ATTAATAAATG GAATCGGAAC AATTACATCA AAATCCACAT
4501 TCTCTTCAAA ATCAATTGTC CTGTACTTCC TTGTTTCATGT GTGTTCAAAA ACGTTATATT
4561 TATAGGATAA TTATACTCTA TTTCTCAACA AGTAATTGGT TGTTTGGCCG AGCGGTCTAA
4621 GGCGCCTGAT TCAAGAAATA TCTTGACCGC AGTTAACTGT GGAATACTC AGGTATCGTA
4681 AGATGCAAGA GTTCGAATCT CTTAGCAACC ATTATTTTTT TCCTCAACAT AACGAGAACA
4741 CACAGGGGCG CTATCGCACA GAATCAAATT CGATGACTGG AAATTTTTTG TTAATTTTCA
4801 AGGTCGCCTG ACGCATATAC CTTTTTCAAC TGAAAAATTG GGAGAAAAAG GAAAGGTGAG
4861 AGGCCGGAAC CGGCTTTTCA TATAGAATAG AGAAGCGTTC ATGACTAAAT GCTTGCATCA
4921 CAATACTTGA AGTTGACAAT ATTATTTAAG GACCTATTGT TTTTCCAAT AGGTGGTTAG
4981 CAATCGTCTT ACTTTCTAAC TTTTCTTACC TTTTACATTT CAGCAATATA TATATATATT
5041 TCAAGGATAT ACCATTCTAA TGTCTGCCCC TATGTCTGCC CCTAAGAAGA TCGTCGTTTT
5101 GCCAGGTGAC CACGTTGGTC AAGAAATCAC AGCCGAAGCC ATTAAGGTTT TTAAGGCTAT
5161 TTCTGATGTT CGTTCCAATG TCAAGTTCGA TTTCGAAAAT CATTTAATTG GTGGTGCTGC
5221 TATCGATGCT ACAGGTGTCC CACTTCCAGA TGAGGCGCTG GAAGCCTCCA AGAAGGTTGA
5281 TGCCGTTTTG TTAGGTGCTG TGGGTGGTCC TAAATGGGGT ACCGGTAGTG TTAGACCTGA
5341 ACAAGGTTTA CTAAAAATCC GTAAAGAACT TCAATTGTAC GCCAACTTAA GACCATGTAA
5401 CTTTGCATCC GACTCTCTTT TAGACTTATC TCCAATCAAG CCACAATTTG CTAAAGGTAC
5461 TGACTTCGTT GTTGTCAGAG AATTAGTGGG AGGTATTTAC TTTGGTAAGA GAAAGGAAGA
5521 CGATGGTGAT GGTGTCGCTT GGGATAGTGA ACAATACACC GTTCCAGAAG TGCAAAGAAT
5581 CACAAGAATG GCCGCTTTCA TGGCCCTACA ACATGAGCCA CCATTGCCTA TTTGGTCTTT
5641 GGATAAAGCT AATGTTTTGG CCTCTTCAAG ATTATGGAGA AAAACTGTGG AGGAAACCAT
5701 CAAGAACGAA TTCCCTACAT TGAAGGTTCA ACATCAATTG ATTGATTCTG CCGCCATGAT
5761 CCTAGTTAAG AACCCAACCC ACCTAAATGG TATTATAATC ACCAGCAACA TGTTTGGTGA
5821 TATCATCTCC GATGAAGCCT CCGTTATCCC AGGTTCTTGT GGTGTTGTTG CATCTGCGTC
5881 CTTGGCCTCT TTGCCAGACA AGAACACCGC ATTTGGTTTG TACGAACCAT GCCACGGTTC-

Figure 41C

5941	TGCTCCAGAT	TTGCCAAAGA	ATAAGGTTGA	CCCTATCGCC	ACTATCTTGT	CTGCTGCAAT
6001	GATGTTGAAA	TTGTCATTGA	ACTTGCCTGA	AGAAGGTAAG	GCCATTGAAG	ATGCAGTTAA
6061	AAAGGTTTTG	GATGCAGGTA	TCAGAACTGG	TGATTTAGGT	GGTTCCAACA	GTACCACCGA
6121	AGTCGGTGAT	GCTGTCGCCG	AAGAAGTTAA	GAAAATCCTT	GCTTAAAAAG	ATTCTCTTTT
6181	TTTATGATAT	TTGTACATAA	ACTTTATAAA	TGAAATTCAT	AATAGAAACG	ACACGAAATT
6241	ACAAAATGGA	ATATGTTTCA	AGGGTAGACG	AAACTATATA	CGCAATCTAC	ATACATTTAT
6301	CAAGAAGGAG	AAAAAGGAGG	ATAGTAAAGG	AATACAGGTA	AGCAAATTGA	TACTAATGGC
6361	TCAACGTGAT	AAGGAAAAAG	AATTGCACTT	TAACATTAAT	ATTGACAAGG	AGGAGGGCAC
6421	CACACAAAAA	GTTAGGTGTA	ACAGAAAATC	ATGAAACTAC	GATTCCTAAT	TTGATATTGG
6481	AGGATTTTCT	CTAAAAAATA	AAAAATACAA	CAAATAAAAA	ACACTCAATG	ACCTGACCAT
6541	TTGATGGAGT	TTAAGTCAAT	ACCTTCTTGA	ACCATTTCCC	ATAATGGTGA	AAGTTCCCTC
6601	AAGAATTTTA	CTCTGTCAGA	AACGGCCTTA	CGACGTAGTC	GATATGGTGC	ACTCTCAGTA
6661	CAATCTGCTC	TGATGCCGCA	TAGTTAAGCC	AGCCCCGACA	CCCGCCAACA	CCCGCTGACG
6721	CGCCCTGACG	GGCTTGTCTG	CTCCCGGCAT	CCGCTTACAG	ACAAGCTGTG	ACCGTCTCCG
6781	GGAGCTGCAT	GTGTCAGAGG	TTTTTCACCGT	CATCACCGAA	ACGCGCGAGA	CGAAAGGGCC
6841	TCGTGATACG	CCTATTTTTA	TAGGTTAATG	TCATGATAAT	AATGGTTTCT	TAGGACGGAT
6901	CGCTTGCCTG	TAACCTACAC	GCGCCTCGTA	TCTTTTAAATG	ATGGAATAAT	TTGGGAATTT
6961	ACTCTGTGTT	TATTTATTTT	TATGTTTTGT	ATTTGGATTT	TAGAAAGTAA	ATAAAGAAGG
7021	TAGAAGAGTT	ACGGAATGAA	GAAAAAATAA	TAAACAAAGG	TTTAAAAAAT	TTCAACAAAA
7081	AGCGTACTTT	ACATATATAT	TTATTAGACA	AGAAAAGCAG	ATTAAATAGA	TATACATTCG
7141	ATTAACGATA	AGTAAAATGT	AAAATCACAG	GATTTTTCGTG	TGTGGTCTTC	TACACAGACA
7201	AGATGAAACA	ATTCGGCATT	AATACCTGAG	AGCAGGAAGA	GCAAGATAAA	AGGTAGTATT
7261	TGTTGGCGAT	CCCCCTAGAG	TCTTTTACAT	CTTCGGAAAA	CAAAAACCTAT	TTTTTCTTTA
7321	ATTTCTTTTT	TTACTTTCTA	TTTTTAATTT	ATATATTTAT	ATTAAAAAAT	TTAAATTATA
7381	ATTATTTTTA	TAGCACGTGA	TGAAAAGGAC	CCAGGTGGCA	CTTTTCGGGG	AAATGTGCGC
7441	GGAACCCCTA	TTTGTTTTAT	TTTCTAAATA	CATTCAAATA	TGTATCCGCT	CATGAGACAA
7501	TAACCCTGAT	AAATGCTTCA	ATAATCTGCA	GCTCTGGCCC	GTGTCTCAAA	ATCTCTGATG
7561	TTACATTGCA	CAAGATAAAA	ATATATCATC	ATGAACAATA	AAACTGTCTG	CTTACATAAA
7621	CAGTAATACA	AGGGGTGTTA	TGAGCCATAT	TCAACGGGAA	ACGTCTTGCT	GGAGGCCGCG
7681	ATTAAATTCC	AACATGGATG	CTGATTTATA	TGGGTATAAA	TGGGCTCGCG	ATAATGTCGG
7741	GCAATCAGGT	GCGACAATCT	TTCGATTGTA	TGGGAAGCCC	GATGCGCCAG	AGTTGTTTCT
7801	GAAACATGGC	AAAGGTAGCG	TTGCCAATGA	TGTTACAGAT	GAGATGGTCA	GAATAAATCTG
7861	GCTGACGGAA	TTTATGCCTC	TTCCGACCAT	CAAGCATTTT	ATCCGTACTC	CTGATGATGC
7921	ATGGTTACTC	ACCACTGCGA	TCCGCGGGAA	AACAGCATTC	CAGGTATTAG	AAGAATATCC
7981	TGATTCAGGT	GAAAATATTG	TTGATGCGCT	GGCAGTGTTT	CTGCGCCGGT	TGCATTTCGAT
8041	TCCTGTTTGT	AATTGTCTTT	TTAACAGCGA	TCGCGTATTT	CGTCTCGCTC	AGGCGCAATC
8101	ACGAATGAAT	AACGGTTTGG	TTGATGCGAG	TGATTTTGAT	GACGAGCGTA	ATGGCTGGCC
8161	TGTTGAACAA	GTCTGGAAAG	AAATGCATAC	GCTTTTGCCA	TTCTCACCGG	ATTCAGTCGT
8221	CACTCATGGT	GATTTCTCAC	TTGATAACCT	TATTTTGTAC	GAGGGGAAAT	TAATAGGTTG
8281	TATTGATGTT	GGACGAGTCG	GAATCGCAGA	CCGATACCAG	GATCTTGCCA	TCCTATGGAA
8341	CTGCCTCGGT	GAGTTTTCTC	CTTCATTACA	GAAACGGCTT	TTTCAAAAAT	ATGGTATTGA
8401	TAATCCTGAT	ATGAATAAAT	TGCAGTTTCA	TTTGATGCTC	GATGAGTTTT	TCTAATCAGA
8461	ATTGGTTAAT	TGGTTGTAAC	ACTGGCAGAG	CATTACGCTG	ACTTGACGGG	ACGGCGCATG
8521	ACCAAAATCC	CTTAACGTGA	GTTTTTCGTT	CACTGAGCGT	CAGACCCCGT	AGAAAAGATC
8581	AAAGGATCTT	CTTGAGATCC	TTTTTTTCTG	CGCGTAATCT	GCTGCTTGCA	AACAAAAAAA
8641	CCACCGCTAC	CAGCGGTGGT	TTGTTTGCCG	GATCAAGAGC	TACCAACTCT	TTTTCCGAAG
8701	GTAACCTGGT	TCAGCAGAGC	GCAGATACCA	AATACTGTCC	TTCTAGTGTA	GCCGTAGTTA
8761	GGCCACCACT	TCAAGAACTC	TGTAGCACCG	CCTACATACC	TCGCTCTGCT	AATCCTGTTA
8821	CCAGTGGCTG	CTGCCAGTGG	CGATAAGTCG	TGTCTTACCG	GGTTGGACTC	AAGACGATAG
8881	TTACCGGATA	AGGCGCAGCG	GTCGGGCTGA	ACGGGGGGTT	CGTGACACAC	GCCCAGCTTG
8941	GAGCGAACGA	CCTACACCGA	ACTGAGATAC	CTACAGCGTG	AGCATTGAGA	AAGCGCCACG
9001	CTTCCCGAAG	GGAGAAAGGC	GGACAGGTAT	CCGGTAAGCG	GCAGGGTTCG	AACAGGAGAG
9061	CGCACGAGGG	AGCTTCCAGG	GGGGAACGCC	TGGTATCTTT	ATAGTCCTGT	CGGGTTTCGC
9121	CACCTCTGAC	TTGAGCGTCG	ATTTTTGTGA	TGCTCGTCAG	GGGGGCCGAG	CCTATGGAAA
9181	AACGCCAGCA	ACGCGGCCTT	TTTACGGTTC	CTGGCCTTTT	GCTGGCCTTT	TGCTCACATG
9241	TTCTTTTCTG	CGTTATCCCC	TGATTCTGTG	GATAACCGTA	TTACCGCCTT	TGAGTGAGCT
9301	GATACCGCTC	GCCGCAGCCG	AACGACCGAG	CGCAGCGAGT	CAGTGAGCGA	GGAAGCGGAA
9361	GAGCGCCCAA	TACGCAAACC	GCCTCTCCCC	GCGCGTTGGC	CGATTCATTA	ATGCAGCTGG

FIGURE 4 (D)

9421	CACGACAGGT	TTCCCGACTG	GAAAGCGGGC	AGTGAGCGCA	ACGCAATTAA	TGTGAGTTAC
9481	CTCACTCATT	AGGCACCCCA	GGCTTTACAC	TTTATGCTTC	CGGCTCCTAT	GTTGTGTGGA
9541	ATTGTGAGCG	GATAACAATT	TCACACAGGA	AACAGCTATG	ACCATGATTA	CGCCAAGCTC
9601	GGAATTAACC	CTCACTAAAG	GGAACAAAAG	CTGGTACCGA	TCCCGAGCTT	TGCAAATTAA
9661	AGCCTTCGAG	CGTCCCAAAA	CCTTCTCAAG	CAAGGTTTTTC	AGTATAATGT	TACATGCGTA
9721	CACGCGTCTG	TACAGAAAAA	AAAGAAAAAT	TTGAAATATA	AATAACGTTC	TTAATACTAA
9781	CATAACTATA	AAAAAATAAA	TAGGGACCTA	GACTTCAGGT	TGTCTAACTC	CTTCCTTTTC
9841	GGTTAGAGCG	GATGTGGGGG	GAGGGCGTGA	ATGTAAGCGT	GACATAACTA	ATTACATGAT
9901	ATCGACAAAG	GAAAAGGGGC	CTGTTTACTC	ACAGGCTTTT	TTCAAGTAGG	TAATTAAGTC
9961	GTTTCTGTCT	TTTTCTTCT	TCAACCCACC	AAAGGCCATC	TTGGTACTTT	TTTTTTTTTTT
10021	TTTTTTTTTTT	TTTTTTTTTTT	TTTTTTTTTTT	TTTTTTTTTTT	TTTTTTTTTTT	TTTTTTTTTTT
10081	TTTTTTTTTTT	TTTTTTTTTTT	TCATAGAAAT	AATACAGAAG	TAGATGTTGA	ATTAGATTAA
10141	ACTGAAGATA	TATAATTTAT	TGGAAAATAC	ATAGAGCTTT	TTGTTGATGC	GCTTAAGCGA
10201	TCAATTCAAC	AACACCACCA	GCAGCTCTGA	TTTTTTCTTC	AGCCAACCTG	GAGACGAATC
10261	TAGCTTTGAC	GATAACTGGA	ACATTTGGAA	TTCTACCCTT	ACCCAAGATC	TTACCGTAAC
10321	CGGCTGCCAA	AGTGTCAATA	ACTGGAGCAG	TTTCCTTAGA	AGCAGATTTT	AAGTATTGGT
10381	CTCTCTTGTC	TTCTGGGATC	AATGTCCACA	ATTTGTCCAA	GTTCAAGACT	GGCTTCCAGA
10441	AATGAGCTTG	TTGCTTGTTG	AAGTATCTCA	TACCAACCTT	ACCGAAATAA	CCTGGATGGT
10501	ATTTATCCAT	GTTAATTCTG	TGGTGATGTT	GACCACCGGC	CATACCTCTA	CCACCGGGGT
10561	GCTTTCTGTG	CTTACCGATA	CGACCTTTAC	CGGCTGAGAC	GTGACCTCTG	TGCTTTCTAG
10621	TCTTAGTGAA	TCTGGAAGGC	ATTCTTGATT	AGTTGGATGA	TTGTTCTGGG	ATTTAATGCA
10681	AAAATCACTT	AAGAAGGAAA	ATCAACGGAG	AAAGCAAACG	CCATCTTAAA	TATACGGGAT
10741	ACAGATGAAA	GGGTTTGAAC	CTATCTGGAA	AATAGCATTG	AACAAGCGAA	AAACTGCGAG
10801	GAAAATTGTT	TGCGTCTCTG	CGGGCTATTC	ACGCGCCAGA	GGAAAATAGG	AAAAATAACA
10861	GGGCATTAGA	AAAATAATTT	TGATTTTGGT	AATGTGTGGG	TCCTGGTGTA	CAGATGTTAC
10921	ATTGGTTACA	GTAATCTTGT	TTTTGCTGTG	TTTTTCGATG	AATCTCCAAA	ATGGTTGTTA
10981	GCACATGGAA	GAGTCACCGA	TGCTAAGTTA	TCTCTATGTA	AGCTACGTGG	CGTGACTTTT
11041	GATGAAGCCG	CACAAGAGAT	ACAGGATTGG	CAACTGCAAA	TAGAATCTGG	GGATCCCCCC
11101	TCGAGATCCG	GGATCGAAGA	AATGATGGTA	AATGAAATAG	GAAATCAAGG	AGCATGAAGG
11161	CAAAAGACAA	ATATAAGGGT	CGAACGAAAA	ATAAAGTGAA	AAGTGTTGAT	ATGATGTATT
11221	TGGCTTTGCG	GCGCCGAAAA	AACGAGTTTA	CGCAATTGCA	CAATCATGCT	GACTCTGTGG
11281	CGGACCCGCG	CTCTTGCCGG	CCCGGCGATA	ACGCTGGGCG	TGAGGCTGTG	CCCGGCGGAG
11341	TTTTTTGCGC	CTGCATTTTC	CAAGGTTTAC	CCTGCGCTAA	GGGGCGAGAT	TGGAGAAGCA
11401	ATAAGAATGC	CGGTGTTGGT	TGCGATGATG	ACGACCACGA	CAACTGGTGT	CATTATTTAA
11461	GTTGCCGAAA	GAACCTGAGT	GCATTTGCAA	CATGAGTATA	CTAGAAGAAT	GAGCCAAGAC
11521	TTGCGAGACG	CGAGTTTGCC	GGTGGTGCGA	ACAATAGAGC	GACCATGACC	TTGAAGGTGA
11581	GACGCGCATA	ACCGCTAGAG	TACTTTGAAG	AGGAAACAGC	AATAGGGTTG	CTACCAGTAT
11641	AAATAGACAG	GTACATACAA	CACTGGAAAT	GGTTGTCTGT	TTGAGTACGC	TTTCAATTCA
11701	TTTGGGTGTG	CAC				

FIGURE 415

Figure 42A:

pDEST22

2-Hybrid Vector with Activation Domain

657 acg cac act act ctc taa tga gca acg gta tac ggc ctt cct tcc agt tac
tgc gtg tga tga gag att act cgt tgc cat atg ccg gaa gga agg tca atg

708 ttg aat ttg aaa taa aaa aag ttt gcc gct ttg cta tca agt ata aat aga
aac tta aac ttt att ttt ttc aaa cgg cga aac gat agt tca tat tta tct

759 cct gca att att aat ctt ttg ttt cct cgt cat tgt tct cgt tcc ctt tct
gga cgt taa taa tta gaa aac aaa gga gca gta aca aga gca agg gaa aga

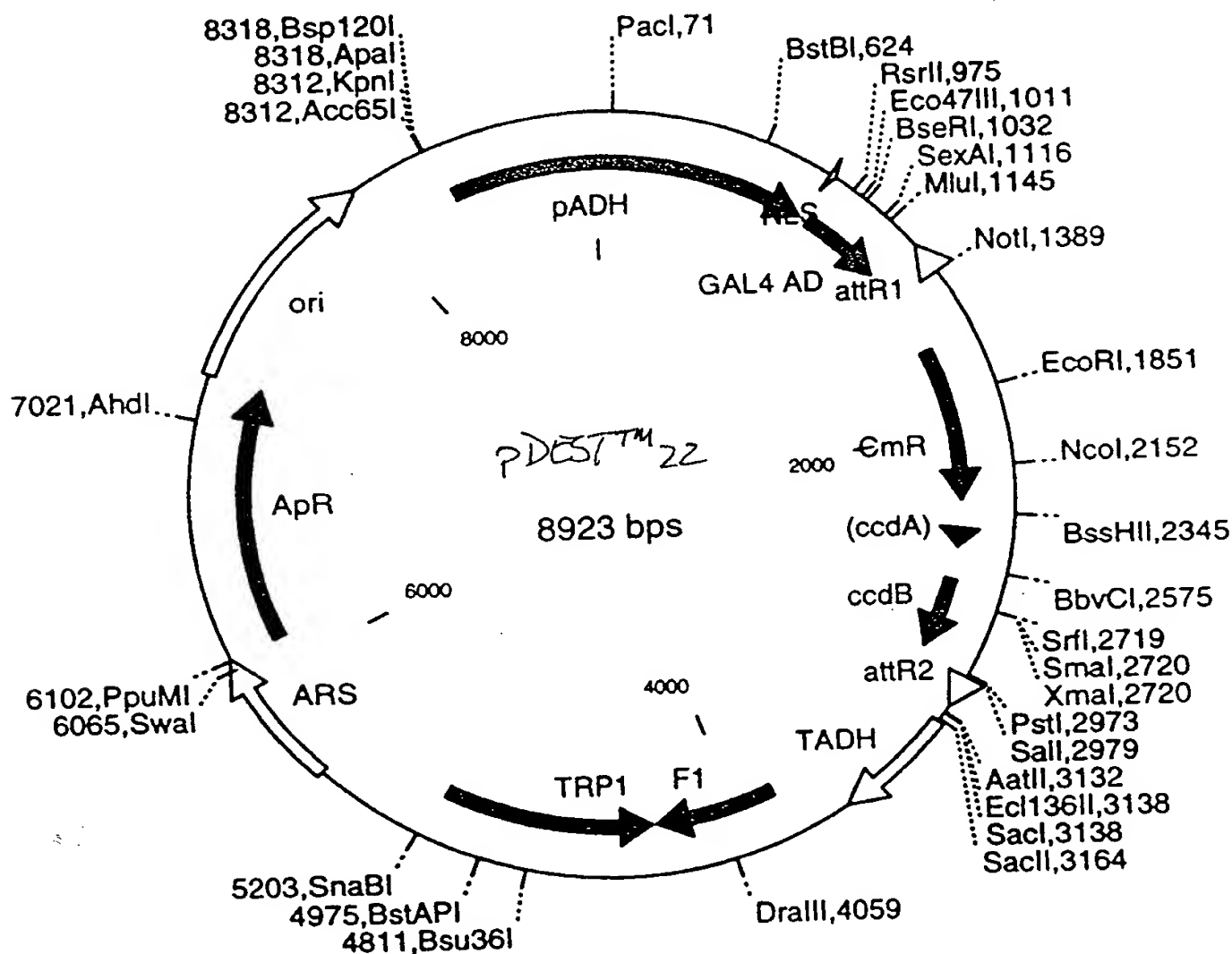
810 ~~ttc ttg ttt ctt ttt ctc cac aat att tca agc tat acc aag cat aca atc~~
~~agg aac aaa gaa aaa gac gtg tta taa agt tgc ata tgg ttc gta tct tag~~

861 ~~aac tcc aag ctt atg ccc aag aag aag cgg aag gtc tgc agc ggc gcc aat~~
~~ttg agg ttc gaa tac ggg ttc ttc ttc gcc ttc cag agc tgc ccg cgg tta~~

1218 gaa gat acc cca cca aac cca aaa aaa gag ggt ggg tgc aat caa aca agt
ctt cta tgg ggt ggt ttg ggt ttt ttt ctc cca ccc agc tta gtt tgt tca

1269 L Y K K A att RI
ttg tac aaa aaa gct gaa cga gaa acg taa a
aac atg ttt ttt cga ctt gct ctt tgc att t

Start Translation



pDEST22 8923 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
904..1248	GAL4 AD
1388..1264	attR1
1638..2297	CmR
2417..2501	inactivated ccdA
2639..2944	ccdB
2985..3109	attR2
3831..4318	f1 (f1 intergenic region)
4334..5176	TRP1
6110..7194	ampR
8344..866	pADH (yeast ADH promoter)

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1  TTCATTTGGG TGTGCACTTT ATTATGTTAC AATATGGAAG GGAACCTTAC ACTTCTCCTA
61  TGCACATATA TTAATTAAAG TCCAATGCTA GTAGAGAAGG GGGGTAACAC CCCTCCGCGC
121 TCTTTTCCGA TTTTCTCTCT AACCCTGGAA TATTTTCGGAT ATCCTTTTGT TGTTTCCGGG
181 TGTACAATAT GGACTTCCTC TTTTCTGGCA ACCAAACCCA TACATCGGGA TTCCTATAAT
241 ACCTTCGTTG GTCTCCCTAA CATGTAGGTG GCGGAGGGGA GATATACAAT AGAACAGATA
301 CCAGACAAGA CATAATGGGC TAAACAAGAC TACACCAATT AACTGCCTC ATTGATGGTG
361 GTACATAACG AACTAATACT GTAGCCCTAG ACTTGATAGC CATCATCATA TCGAAGTTTC
421 ACTACCCTTT TTCCATTTGC CATCTATTGA AGTAATAATA GGCGCATGCA ACTTCTTTTC
481 TTTTTTTTTT TTTTCTCTCT CCCCCGTTGT TGTCTCACCA TATCCGCAAT GACAAAAAAA
541 ATGATGGAAG AACTAAAGG AAAAAATTAA CGACAAAGAC AGCACCAACA GATGTCGTTG
601 TTCCAGAGCT GATGAGGGGT ATCTTCGAAC ACACGAAACT TTTTCCTTCC TTCATTCACG
661 CACACTACTC TCTAATGAGC AACGGTATAC GGCCTTCCTT CCAGTTACTT GAATTTGAAA
721 TAAAAAAAGT TTGCCGCTTT GCTATCAAGT ATAAATAGAC CTGCAATTAT TAATCTTTTG
781 TTTCTCGTC ATTGTTCTCG TTCCCTTTCT TCCTTGTTTC TTTTCTGCA CAATATTTCA
841 AGCTATACCA AGCATACAAT CAACTCCAAG CTTATGCCCC AGAAGAAGCG GAAGGTCTCG
901 AGCGGCGCCA ATTTTAATCA AAGTGGGAAT ATTGCTGATA GCTCATTGTC CTTCACTTTC
961 ACTAACAGTA GCAACGGTCC GAACCTCATA ACAACTCAAA CAAATTCTCA AGCGCTTTCA
1021 CAACCAATTG CCTCCTCTAA CGTTCATGAT AACTTCATGA ATAATGAAAT CACGGCTAGT
1081 AAAATTGATG ATGGTAATAA TTCAAAACCA CTGTCACCTG GTTGGACGGA CCAAACTGCG
1141 TATAACGCGT TTGGAATCAC TACAGGGATG TTTAATACCA CTACAATGGA TGATGTATAT
1201 AACTATCTAT TCGATGATGA AGATACCCCA CCAAACCCAA AAAAAGAGGG TGGGTCTGAAT
1261 CAAACAAGTT TGTACAAAAA AGCTGAACGA GAAACGTAAA ATGATATAAA TATCAATATA
1321 TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAAACACA ACATATCCAG
1381 TCACTATGGC GGCCGCTAAG TTGGCAGCAT CACCCGACGC ACTTTGCGCC GAATAAATAC
1441 CTGTGACGGA AGATCACTTC GCAGAATAAA TAAATCCTGG TGTCCCTGTT GATACCGGGA
1501 AGCCCTGGGC CAACTTTTGG CGAAAATGAG ACGTTGATCG GCACGTAAGA GGTTCCTCACT
1561 TTCACCATAA TGAAATAAGA TCACTACCGG GCGTATTTTT TGAGTTATCG AGATTTTCAG
1621 GAGCTAAGGA AGCTAAAATG GAGAAAAAAA TCACTGGATA TACCACCGTT GATATATCCC
1681 AATGGCATCG TAAAGAACAT TTTGAGGCAT TTCAGTCAGT TGCTCAATGT ACCTATAACC
1741 AGACCGTTCA GCTGGATATT ACGGCCTTTT TAAAGACCGT AAAGAAAAAT AAGCACAAGT
1801 TTTATCCGGC CTTTATTCAC ATTCTTGCCC GCCTGATGAA TGCTCATCCG GAATTCCGTA
1861 TGGCAATGAA AGACGGTGAG CTGGTGATAT GGGATAGTGT TCACCCTTGT TACACCGTTT
1921 TCCATGAGCA AACTGAAACG TTTTCATCGC TCTGGAGTGA ATACCACGAC GATTTCGGGC
1981 AGTTTCTACA CATATATTCG CAAGATGTGG CGTGTTACGG TGAAAACCTG GCCTATTTCC
2041 CTAAAGGGTT TATTGAGAAT ATGTTTTTCG TCTCAGCCAA TCCCTGGGTG AGTTTCACCA
2101 GTTTTGATTT AAACGTGGCC AATATGGACA ACTTCTTCGC CCCCCTTTTC ACCATGGGCA
2161 AATATTATAC GCAAGGCGAC AAGGTGCTGA TGCCGCTGGC GATTCAGGTT CATCATGCCG
2221 TCTGTGATGG CTTCCATGTC GGCAGAATGC TTAATGAATT ACAACAGTAC TGCGATGAGT
2281 GGCAGGGCGG GGCGTAATCT AGAGGATCCG GCTTACTAAA AGCCAGATAA CAGTATGCGT
2341 ATTTGCGCGC TGATTTTTCG GGTATAAGAA TATATACTGA TATGTATACC CGAAGTATGT
2401 CAAAAAGAGG TGTGCTATGA AGCAGCGTAT TACAGTGACA GTTGACAGCG ACAGCTATCA
2461 GTTGCTCAAG GCATATATGA TGTCAATATC TCCGGTCTGG TAAGCACAAC CATGCAGAAT
2521 GAAGCCCGTC GTCTGCGTGC CGAACGCTGG AAAGCGGAAA ATCAGGAAGG GATGGCTGAG-

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FIGURE 42B

2581 GTCGCCCGGT TTATTGAAAT GAACGGCTCT TTTGCTGACG AGAACAGGGA CTGGTGAAAT
 2641 GCAGTTTAAG GTTTACACCT ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG TGGATGTACA
 2701 GAGTGATATT ATTGACACGC CCGGGCGACG GATGGTGATC CCCCTGGCCA GTGCACGTCT
 2761 GCTGTCAGAT AAAGTCTCCC GTGAACTTTA CCCGGTGGTG CATATCGGGG ATGAAAGCTG
 2821 GCGCATGATG ACCACCGATA TGGCCAGTGT GCCGGTCTCC GTTATCGGGG AAGAAGTGGC
 2881 TGATCTCAGC CACCGCGAAA ATGACATCAA AAACGCCATT AACCTGATGT TCTGGGGAAT
 2941 ATAAATGTCA GGCTCCCTTA TACACAGCCA GTCTGCAGGT CGACCATAGT GACTGGATAT
 3001 GTTGTGTTTT ACAGTATTAT GTAGTCTGTT TTTTATGCAA AATCTAATTT AATATATTGA
 3061 TATTTATATC ATTTTACGTT TCTCGTTCAG CTTTCTTGTA CAAAGTGGTT TGATGGCCGC
 3121 TAAGTAAGTA AGACGTCGAG CTCTAAGTAA GTAACGGCCG CCACCGCGGT GGAGCTTTGG
 3181 ACTTCTTCGC CAGAGGTTTG GTCAAGTCTC CAATCAAGGT TGTCGGCTTG TCTACCTTGC
 3241 CAGAAATTTA CGAAAAGATG GAAAAGGGTC AAATCGTTGG TAGATACGTT GTTGACACTT
 3301 CTAAATAAGC GAATTTCTTA TGATTTATGA TTTTATTAT TAAATAAGTT ATAAAAAAA
 3361 TAAGTGTATA CAAATTTTAA AGTGACTCTT AGGTTTTTAA ACGAAAATTC TTATTCTTGA
 3421 GTAACCTCTT CCTGTAGGTC AGGTTGCTTT CTCAGGTATA GCATGAGGTC GCTCTTATTG
 3481 ACCACACCTC TACCGGCATG CCGAGCAAAT GCCTGCAAAT CGCTCCCCAT TTCACCCAAT
 3541 TGTAGATATG CTAACCTCCAG CAATGAGTTG ATGAATCTCG GTGTGTATTT TATGTCCTCA
 3601 GAGGACAATA CCTGTTGTAA TCGTTCTTCC ACACGGATCC CAATTCGCCC TATAGTGAGT
 3661 CGTATTACAA TTCACTGGCC GTCGTTTTAC AACGTCGTGA CTGGGAAAAC CCTGGCGTTA
 3721 CCCAACTTAA TCGCCTTGCA GCACATCCCC CTTTCGCCAG CTGGCGTAAT AGCGAAGAGG
 3781 CCCGCACCGA TCGCCCTTCC CAACAGTTGC GCAGCCTGAA TGGCGAATGG ACGCGCCCTG
 3841 TAGCGGCGCA TTAAGCGCGG CGGGTGTGGT GGTACGCGC AGCGTGACCG CTACACTTGC
 3901 CAGCGCCCTA GCGCCCGCTC CTTTCGCTTT CTTCCCTTCC TTTCTCGCCA CGTTCGCCGG
 3961 CTTTCCCCGT CAAGCTCTAA ATCGGGGGCT CCCTTTAGGG TTCCGATTTA GTGCTTTACG
 4021 GCACCTCGAC CCCAAAAAAC TTGATTAGGG TGATGGTTCA CGTAGTGGGC CATCGCCCTG
 4081 ATAGACGGTT TTTTCGCCCT TGACGTTGGA GTCCACGTTT TTTAATAGTG GACTCTTGTT
 4141 CCAAACTGGA ACAACACTCA ACCCTATCTC GGTCTATTCT TTTGATTTAT AAGGGATTTT
 4201 GCCGATTTTC GCCTATTGGT TAAAAAATGA GCTGATTTAA CAAAAATTTA ACGCGAATTT
 4261 TAACAAAATA TTAACGTTTA CAATTTCTTG ATGCGGTATT TTCTCCTTAC GCATCTGTGC
 4321 GGTATTTTAC ACCGCAGGCA AGTGCACAAA CAATACTTAA ATAAATACTA CTCAGTAATA
 4381 ACCTATTTCT TAGCATTTTT GACGAAATTT GCTATTTTGT TAGAGTCTTT TACACCATTT
 4441 GTCTCCACAC CTCCGCTTAC ATCAACACCA ATAACGCCAT TTAATCTAAG CGCATCACCA
 4501 ACATTTTCTG GCGTCAGTCC ACCAGCTAAC ATAAAATGTA AGCTTTCGGG GCTCTCTTGC
 4561 CTTCCAACCC AGTCAGAAAT CGAGTTCCAA TCCAAAAGTT CACCTGTCCC ACCTGCTTCT
 4621 GAATCAAACA AGGGAATAAA CGAATGAGGT TTCTGTGAAG CTGCACTGAG TAGTATGTTG
 4681 CAGTCTTTTG GAAATACGAG TCTTTTAATA ACTGGCAAAC CGAGGAACTC TTGGTATTCT
 4741 TGCCACGACT CATCTCCATG CAGTTGGACG ATATCAATGC CGTAATCATT GACCAGAGCC
 4801 AAAACATCCT CCTTAGGTTG ATTACGAAAC ACGCCAACCA AGTATTTTCG AGTGCCTGAA
 4861 CTATTTTAT ATGCTTTTAC AAGACTTGAA ATTTTCCTTG CAATAACCGG GTCAATTGTT
 4921 CTCTTTCTAT TGGGCACACA TATAATACCC AGCAAGTCAG CATCGGAATC TAGAGCACAT
 4981 TCTGCGGCTT CTGTGCTCTG CAAGCCGCAA ACTTTCACCA ATGGACCAGA ACTACCTGTG
 5041 AAATTAATAA CAGACATACT CCAAGCTGCC TTTGTGTGCT TAATCACGTA TACTCACGTG
 5101 CTCAATAGTC ACCAATGCCC TCCCTCTTGG CCCTCTCCTT TTCTTTTTTC GACCGAATTA
 5161 ATTCTTAATC GGCAAAAAAA GAAAAGCTCC GGATCAAGAT TGTACGTAAG GTGACAAGCT
 5221 ATTTTTCAT AAAGAATATC TTCCACTACT GCCATCTGGC GTCATAACTG CAAAGTACAC
 5281 ATATATTACG ATGCTGTCTA TTAAATGCTT CCTATATTAT ATATATAGTA ATGTCGTTTA
 5341 TGGTGCACCT TCAGTACAAT CTGCTCTGAT GCCGCATAGT TAAGCCAGCC CCGACACCCG
 5401 CCAACACCCG CTGACGCGCC CTGACGGGCT TGTCTGCTCC CGGCATCCGC TTACAGACAA
 5461 GCTGTGACCG TCTCCGGGAG CTGCATGTGT CAGAGGTTTT CACCGTCATC ACCGAAACGC
 5521 GCGAGACGAA AGGGCCTCGT GATACGCCTA TTTTATAGG TTAATGTCAT GATAATAATG
 5581 GTTCTTAGG ACGGATCGCT TGCCTGTAAC TTACACGCGC CTCGTATCTT TTAATGATGG
 5641 AATAATTTGG GAATTTACTC TGTGTTTATT TATTTTATG TTTTGTATTT GGATTTTAGA
 5701 AAGTAAATAA AGAAGGTAGA AGAGTTACGG AATGAAGAAA AAAAAATAAA CAAAGGTTTA
 5761 AAAAATTTCA AAAAAAGCG TACTTTACAT ATATATTTAT TAGACAAGAA AAGCAGATTA
 5821 AATAGATATA CATTCGATTA ACGATAAGTA AAATGTAAAA TCACAGGATT TTCGTGTGTG
 5881 GTCTTCTACA CAGACAAGAT GAAACAATTC GGCATTAATA CCTGAGAGCA GGAAGAGCAA
 5941 GATAAAAGGT AGTATTTGTT GGCGATCCCC CTAGAGTCTT TTACATCTTC GGAAAACAAA
 6001 AACTATTTTT TCTTTAATTT CTTTTTTTAC TTTCTATTTT TAATTTATAT ATTTATATTA-

FIGURE 42C

6061 6121 6181 6241 6301 6361 6421 6481 6541 6601 6661 6721 6781 6841 6901 6961 7021 7081 7141 7201 7261 7321 7381 7441 7501 7561 7621 7681 7741 7801 7861 7921 7981 8041 8101 8161 8221 8281 8341 8401 8461 8521 8581 8641 8701 8761 8821 8881

AAAAATTTAA ATTATAATTA TTTTATAGC ACGTGATGAA AAGGACCCAG GTGGCACTTT
TCGGGGAAAT GTGCGCGGAA CCCCTATTTG TTTATTTTTC TAAATACATT CAAATATGTA
TCCGCTCATG AGACAATAAC CCTGATAAAT GCTTCAATAA TATTGAAAAA GGAAGAGTAT
GAGTATTCAA CATTTCCGTG TCGCCCTTAT TCCCTTTTTT GCGGCATTTT GCCTTCCTGT
TTTTGCTCAC CCAGAAACGC TGGTGAAAGT AAAAGATGCT GAAGATCAGT TGGGTGCACG
AGTGGGTTAC ATCGAACTGG ATCTCAACAG CCGTAAGATC CTTGAGAGTT TTCGCCCCGA
AGAACGTTTT CCAATGATGA GCACTTTTAA AGTTCTGCTA TGTGGCGCGG TATTATCCCG
TATTGACGCC GGGCAAGAGC AACTCGGTG CCGCATAAC TATTCTCAGA ATGACTTGGT
TGAGTACTCA CCAGTCACAG AAAAGCATCT TACGGATGGC ATGACAGTAA GAGAATTATG
CAGTGCTGCC ATAACCATGA GTGATAACAC TGCGGCCAAC TTACTTCTGA CAACGATCGG
AGGACCGAAG GAGCTAACCG CTTTTTTTCA CAACATGGGG GATCATGTAA CTCGCCTTGA
TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA CCACGATGCC
TGTAGCAATG GCAACAACGT TGCGCAAAC ATTAAGTGGC GAACTACTTA CTCTAGCTTC
CCGGCAACAA TTAATAGACT GGATGGAGGC GGATAAAGTT GCAGGACCAC TTCTGCGCTC
GGCCCTTCCG GCTGGCTGGT TTATTGCTGA TAAATCTGGA GCCGGTGAGC GTGGGTCTCG
CGGTATCATT GCAGCACTGG GGCCAGATGG TAAGCCCTCC CGTATCGTAG TTATCTACAC
GACGGGCAGT CAGGCAACTA TGGATGAACG AAATAGACAG ATCGCTGAGA TAGGTGCCTC
ACTGATTAAG CATTGGTAAC TGTCAGACCA AGTTTACTCA TATATACTTT AGATTGATTT
AAAACCTTCAT TTTTAATTTA AAAGGATCTA GGTGAAGATC CTTTTTGATA ATCTCATGAC
CAAATCCCT TAACGTGAGT TTTCGTTCCA CTGAGCGTCA GACCCCGTAG AAAAGATCAA
AGGATCTTCT TGAGATCCTT TTTTCTGCG CGTAATCTGC TGCTTGCAAA CAAAAAACC
ACCGTACCA GCGGTGGTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT TTCCGAAGGT
AACTGGCTTC AGCAGAGCGC AGATACCAA TACTGTCTT CTAGTGTAGC CGTAGTTAGG
CCACCACTTC AAGAACTCTG TAGCACCGCC TACATACCTC GCTCTGCTAA TCCTGTTACC
AGTGGCTGCT GCCAGTGGCG ATAAGTCGTG TCTTACCGGG TTGGACTCAA GACGATAGTT
ACCGGATAAG GCGCAGCGGT CGGGCTGAAC GGGGGGTTCG TGCACACAGC CCAGCTTGGA
GCGAACGACC TACACCGAAC TGAGATACCT ACAGCGTGAG CATTGAGAAA GCGCCACGCT
TCCCGAAGGG AGAAAGGCGG ACAGGTATCC GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG
CACGAGGGAG CTTCCAGGGG GGAACGCCTG GTATCTTTAT AGTCCTGTGCG GGTTCGCCA
CCTCTGACTT GAGCGTCGAT TTTTGTGATG CTCGTCAGGG GGGCCGAGCC TATGAAAAA
CGCCAGCAAC GCGGCCTTTT TACGGTTCCT GGCCTTTTGC TGGCCTTTTG CTCACATGTT
CTTTCCTGCG TTATCCCCTG ATTCTGTGGA TAACCGTATT ACCGCCTTTG AGTGAGCTGA
TACCGCTCGC CGCAGCCGAA CGACCGAGCG CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA
GCGCCCAATA CGCAAACCGC CTCTCCCCGC GCGTTGGCCG ATTCATTAAT GCAGCTGGCA
CGACAGGTTT CCCGACTGGA AAGCGGGCAG TGAGCGCAAC GCAATTAATG TGAGTTACCT
CACTCATTAG GCACCCAGG CTTTACACTT TATGCTTCCG GCTCCTATGT TGTGTGGAAT
TGTGAGCGGA TAACAATTTT ACACAGGAAA CAGCTATGAC CATGATTACG CCAAGCTCGG
AATTAACCCT CACTAAAGGG AACAAAAGCT GGTACCGGG CCCCCCTCG AGATCCGGGA
TCGAAGAAAT GATGGTAAAT GAAATAGGAA ATCAAGGAGC ATGAAGGCAA AAGACAAATA
TAAGGGTCGA ACGAAAAATA AAGTGAAAAG TGTTGATATG ATGTATTTGG CTTTGCGGCG
CCGAAAAAAC GAGTTTACGC AATTGCACAA TCATGCTGAC TCTGTGGCGG ACCCGCGCTC
TTGCCGGCCC GCGGATAACG CTGGGCGTGA GGCTGTGCCC GCGGAGTTT TTTGCGCCTG
CATTTTCCAA GGTTTACCCT GCGCTAAGGG GCGAGATTGG AGAAGCAATA AGAATGCCGG
TTGGGGTTGC GATGATGACG ACCACGACAA CTGGTGTCAT TATTTAAGTT GCCGAAAGAA
CCTGAGTGCA TTTGCAACAT GAGTATACTA GAAGAATGAG CCAAGACTTG CGAGACGCGA
GTTTGCCGGT GGTGCGAACA ATAGAGCGAC CATGACCTTG AAGGTGAGAC GCGCATAACC
GCTAGAGTAC TTTGAAGAGG AAACAGCAAT AGGGTTGCTA CCAGTATAAA TAGACAGGTA
CATAACAAC TGGAATGGT TGTCTGTTTG AGTACGCTTT CAA

Figure 42d

pDEST23

His6 carboxy-fusion vector, T7 promoter,

205 atc ccg cga aat taa tac gac tca cta tag gga gac cac aac ggt ttc cct att atg ctg agt gat atc cgt ctg gtg ttg cca aag gga cta gat cac aag ttt gta caa aaa agc tga acg aga aac gta aaa tga tat gat cta ctg ttc aaa cat gtt ttt tct act tgc tct ttg cat ttt act ata

256 cta gat cac aag ttt gta caa aaa agc tga acg aga aac gta aaa tga tat gat cta ctg ttc aaa cat gtt ttt tct act tgc tct ttg cat ttt act ata

// ————— *Cm^R* ————— *ccd B* ————— //

1888 ttt tta tgc aaa atc taa ttt aat ata ttg ata ttt ata tca ttt tac gtt
aaa aat acg ttt tag att aaa tta tat aac tat aaa tat agt aaa atg caa
1939 attR2 A F L Y K V Y I M S Y Y H H
tct cgt tca gct ttc ttg tac aaa gtg gtg att atg tct tac tac cat cac
aga gca agt cga aag aac atg ttt cac cac taa tac agc atg atg gta gtg
1990 H H H H L D E V Q term His6
cat cac cat cac ctc gat gag caa taa cta gca taa ccc ctt ggg gcc tct
gta gtg gta gtg gag cta ctc gtt att gat cgt att ggg gaa ccc cgg aga

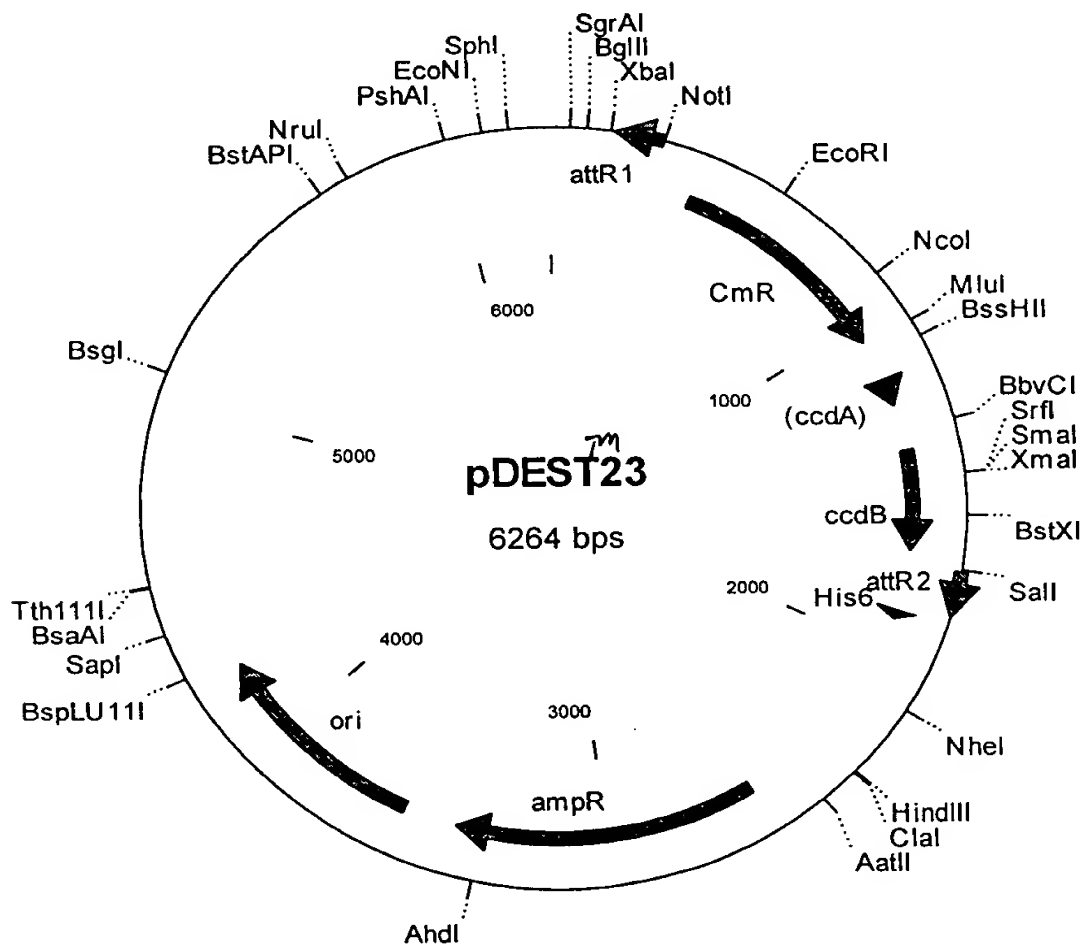


FIGURE 43A

093446-03000

pDEST23 6264 bp

Location (Base Nos.)	Gene Encoded
285..161	attR1
394..1053	CmR
1173..1257	inactivated ccdA
1395..1700	ccdB
1741..1865	attR2
1883..1911	his6
2574..3434	ampR
3583..4222	ori

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1 TCTTCCCCAT CGGTGATGTC GGCGATATAG GCGCCAGCAA CCGCACCTGT GGCGCCGGTG
61 ATGCCGGCCA CGATGCGTCC GGCGTAGAGG ATCGAGATCT CGATCCCGCG AAATTAATAC
121 GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGATC ACAAGTTTGT AAAAAAAGC
181 TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA
241 ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCATTAGGC
301 ACCCCAGGCT TTACACTTTA TGCTTCCGGC TCGTATAATG TGTGGATTTT GAGTTAGGAT
361 CCGGCGAGAT TTTCAGGAGC TAAGGAAGCT AAAATGGAGA AAAAAATCAC TGGATATACC
421 ACCGTTGATA TATCCCAATG GCATCGTAAA GAACATTTTG AGGCATTTC A GTCAGTTGCT
481 CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG CCTTTTAAA GACCGTAAAG
541 AAAAATAAGC ACAAGTTTTA TCCGGCCTTT ATTCACATTC TTGCCC GCCT GATGAATGCT
601 CATCCGGAAT TCCGTATGGC AATGAAAGAC GGTGAGCTGG TGATATGGGA TAGTGTTTCA
661 CCTTGTTACA CCGTTTTCCA TGAGCAAAC TAAACGCGTG GATCCGGCTT ACTAAAAGCC
721 CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG ATGTGGCGTG TTACGGTGAA
781 AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT TTTTCGTCTC AGCCAATCCC
841 TGGGTGAGTT TCACCAGTTT TGATTTAAAC GTGGCCAATA TGGACAACTT CTTCGCCCCC
901 GTTTTCACCA TGGGCAAATA TTATACGCAA GCGGACAAGG TGCTGATGCC GCTGGCGATT
961 CAGGTTTCATC ATGCCGTCGT TGATGGCTTC CATGTCGGCA GAATGCTTAA TGAATTACAA
1021 CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG GATCCGGCTT ACTAAAAGCC
1081 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA TAAGAATATA TACTGATATG
1141 TATACCCGAA GTATGTCAAA AAGAGGTGTG CTATGAAGCA GCGTATTACA GTGACAGTTG
1201 ACAGCGACAG CTATCAGTTG CTCAAGGCAT ATATGATGTC AATATCTCCG GTCTGGTAAG
1261 CACAACCATG CAGAAATGAAG CCCGTCGTCT GCGTGCCGAA CGCTGGAAAG CGGAAAATCA
1321 GGAAGGGATG GCTGAGGTCG CCCGGTTTAT TGAAATGAAC GGCTCTTTTG CTGACGAGAA
1381 CAGGGACTGG TGAAATGCAG TTTAAGGTTT ACACCTATAA AAGAGAGAGC CGTTATCGTC
1441 TGTTTGTGGA TGTACAGAGT GATATTATTG ACACGCCCGG GCGACGGATG GTGATCCCCC
1501 TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA ACTTTACCCG GTGGTGCATA
1561 TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC CAGTGTGCCG GTCTCCGTTA
1621 TCGGGGAAGA AGTGGCTGAT CTCAGCCACC GCGAAAATGA CATCAAAAAC GCCATTAACC
1681 TGATGTTCTG GGGAATATAA ATGTCAGGCT CCCTTATACA CAGCCAGTCT GCAGGTGCAC
1741 CATAGTGA CT GGATATGTTG TGTTTTACAG TATTATGTAG TCTGTTTTTT ATGCAAAATC
1801 TAATTTAATA TATTGATATT TATATCATTT TACGTTTCTC GTTCAGCTTT CTTGTACAAA
1861 GTGGTGATTA TGTCGTACTA CCATCACCAT CACCATCACC TCGATGAGCA ATA ACTAGCA
1921 TAACCCCTTG GGGCCTCTAA ACGGGTCTTG AGGGGTTTTT TGCTGAAAGG AGGAACTATA
1981 TCCGGATATC CACAGGACGG GTGTGGTCGC CATGATCGCG TAGTCGATAG TGGCTCCAAG
2041 TAGCGAAGCG AGCAGGACTG GCGGCGGGCC AAAGCGGTCTG GACAGTGCTC CGAGAACGGG
2101 TGCGCATAGA AATTGCATCA ACGCATATAG CGCTAGCAGC ACGCCATAGT GACTGGCGAT
2161 GCTGTCGGAA TGGACGATAT CCCGCAAGAG GCCCGGCAGT ACCGGCATAA CCAAGCCTAT
2221 GCCTACAGCA TCCAGGGTGA CCGTGCCGAG GATGACGATG AGCGCATTGT TAGATTTTCA
2281 ACACGGTGCC TGACTGCGTT AGCAATTTAA CTGTGATAAA CTACCGCATT AAAGCTTATC
2341 GATGATAAGC TGTCAAACAT GAGAATTCTT GAAGACGAAA GGGCCTCGTG ATACGCCTAT
2401 TTTTATAGGT TAATGTCATG ATAATAATGG TTTCTTAGAC GTCAGGTGGC ACTTTTCGGG
2461 GAAATGTGCG CGGAACCCCT ATTTGTTTAT TTTTCTAAAT ACATTCAAAT ATGTATCCGC
2521 TCATGAGACA ATAACCCTGA TAAATGCTTC AATAATATTG AAAAAGGAAG AGTATGAGTA
2581 TTCAACATTT CCGTGTGCGC CTTATTCCCT TTTTTCGCGC ATTTTGCCTT CCTGTTTTTG
2641 CTCACCCAGA AACGCTGGTG AAAGTAAAG ATGCTGAAGA TCAGTTGGGT GCACGAGTGG -

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FIGURE 43B

2701 GTTACATCGA ACTGGATCTC AACAGCGGTA AGATCCTTGA GAGTTTTTCGC CCCGAAGAAC
 2761 GTTTTCCAAT GATGAGCACT TTTAAAGTTC TGCTATGTGG CGCGGTATTA TCCCGTGTTG
 2821 ACGCCGGGCA AGAGCAACTC GGTGCGCCGA TACACTATTC TCAGAATGAC TTGGTTGAGT
 2881 ACTCACCAGT CACAGAAAAG CATCTTACGG ATGGCATGAC AGTAAGAGAA TTATGCAGTG
 2941 CTGCCATAAC CATGAGTGAT AACACTGCGG CCAACTTACT TCTGACAACG ATCGGAGGAC
 3001 CGAAGGAGCT AACCGCTTTT TTGCACAACA TGGGGGATCA TGTAACCTCGC CTTGATCGTT
 3061 GGAACCGGA GCTGAATGAA GCCATACCAA ACGACGAGCG TGACACCACG ATGCCTGCAG
 3121 CAATGGCAAC AACGTTGCGC AAACATATTAA CTGGCGAACT ACTTACTCTA GCTTCCCGGC
 3181 AACAAATTAAT AGACTGGATG GAGGCGGATA AAGTTGCAGG ACCACTTCTG CGCTCGGCCC
 3241 TTCCGGCTGG CTGGTTTATT GCTGATAAAT CTGGAGCCGG TGAGCGTGGG TCTCGCGGTA
 3301 TCATTGCAGC ACTGGGGCCA GATGGTAAGC CCTCCCGTAT CGTAGTTATC TACACGACGG
 3361 GGAGTCAGGC AACTATGGAT GAACGAAATA GACAGATCGC TGAGATAGGT GCCTCACTGA
 3421 TTAAGCATTG GTAACGTGCA GACCAAGTTT ACTCATATAT ACTTTAGATT GATTTAAAAC
 3481 TTCATTTTTTA ATTTAAAAGG ATCTAGGTGA AGATCCTTTT TGATAATCTC ATGACCAAAA
 3541 TCCCTTAACG TGAGTTTTTCG TTCCACTGAG CGTCAGACCC CGTAGAAAAG ATCAAAGGAT
 3601 CTTCTTGAGA TCCTTTTTTT CTGCGCGTAA TCTGCTGCTT GCAAACAAAA AAACCACCGC
 3661 TACCAGCGGT GGTGTGTTTG CCGGATCAAG AGCTACCAAC TCTTTTTCCG AAGGTAAGTG
 3721 GCTTCAGCAG AGCGCAGATA CCAAATACTG TCCTTCTAGT GTAGCCGTAG TTAGGCCACC
 3781 ACTTCAAGAA CTCTGTAGCA CCGCTACAT ACCTCGCTCT GCTAATCCTG TTACCAGTGG
 3841 CTGCTGCCAG TGGCGATAAG TCGTGTCTTA CCGGGTTGGA CTCAAGACGA TAGTTACCGG
 3901 ATAAGGCGCA GCGGTCGGGC TGAACGGGGG GTTCGTGCAC ACAGCCCAGC TTGGAGCGAA
 3961 CGACCTACAC CGAACTGAGA TACCTACAGC GTGAGCTATG AGAAAGCGCC ACGCTTCCCG
 4021 AAGGGAGAAA GCGGACAGG TATCCGGTAA GCGGCAGGGT CGGAACAGGA GAGCGCACGA
 4081 GGGAGCTTCC AGGGGGAAC GCCTGGTATC TTTATAGTCC TGTCGGGTTT CGCCACCTCT
 4141 GACTTGAGCG TCGATTTTTG TGATGCTCGT CAGGGGGGCG GAGCCTATGG AAAAACGCCA
 4201 GCAACGCGGC CTTTTTACGG TTCCTGGCCT TTTGCTGGCC TTTTGCTCAC ATGTTCTTTC
 4261 CTGCGTTATC CCCTGATTCT GTGGATAACC GTATTACCGC CTTTGAGTGA GCTGATACCG
 4321 CTCGCCGAG CCGAACGACC GAGCGCAGCG AGTCAGTGAG CGAGGAAGCG GAAGAGCGCC
 4381 TGATGCGGTA TTTTCTCCTT ACGCATCTGT GCGGTATTTT ACACCGCATA TATGGTGCAC
 4441 TCTCAGTACA ATCTGCTCTG ATGCCGCATA GTTAAGCCAG TATACACTCC GCTATCGCTA
 4501 CGTGACTGGG TCATGGCTGC GCCCCGACAC CCGCCAACAC CCGCTGACGC GCCCTGACGG
 4561 GCTTGTCTGC TCCCGGCATC CGCTTACAGA CAAGCTGTGA CCGTCTCCGG GAGCTGCATG
 4621 TGTCAGAGGT TTTCACCGTC ATCACCGAAA CGCGCGAGGC AGCTGCGGTA AAGCTCATCA
 4681 GCGTGGTCTG GAAGCGATTC ACAGATGTCT GCCTGTTCAT CCGCGTCCAG CTCGTTGAGT
 4741 TTCTCCAGAA GCGTTAATGT CTGGCTTCTG ATAAAGCGGG CCATGTTAAG GGCGGTTTTT
 4801 TCCTGTTTGG TCACTGATGC CTCCGTGTAA GGGGGATTTC TGTTTCATGGG GGTAATGATA
 4861 CCGATGAAAC GAGAGAGGAT GCTCACGATA CGGGTACTG ATGATGAACA TGCCCGGTTA
 4921 CTGGAACGTT GTGAGGGTAA ACAACTGGCG GTATGGATGC GCGGGGACCA GAGAAAAATC
 4981 ACTCAGGGTC AATGCCAGCG CTTCTGTTAAT ACAGATGTAG GTGTTCCACA GGGTAGCCAG
 5041 CAGCATCCTG CGATGCAGAT CCGGAACATA ATGGTGCAGG GCGCTGACTT CCGCGTTTCC
 5101 AGACTTTACG AAACACGGAA ACCGAAGACC ATTCATGTTG TTGCTCAGGT CGCAGACGTT
 5161 TTGCAGCAGC AGTCGCTTCA CGTTCGCTCG CGTATCGGTG ATTCATTCTG CTAACCAGTA
 5221 AGGCAACCCC GCCAGCCTAG CCGGGTCCTC AACGACAGGA GCACGATCAT GCGCACCCGT
 5281 GGCCAGGACC CAACGCTGCC CGAGATGCGC CGCGTGCGGC TGCTGGAGAT GGCGGACGCG
 5341 ATGGATATGT TCTGCCAAGG GTTGGTTTGC GCATTCACAG TTCTCCGCAA GAATTGATTG
 5401 GCTCCAATTC TTGGAGTGGT GAATCCGTTA GCGAGGTGCC GCCGGCTTCC ATTCAGGTCTG
 5461 AGGTGGCCCG GCTCCATGCA CCGCGACGCA ACGCGGGGAG GCAGACAAGG TATAGGGCGG
 5521 CGCCTACAAT CCATGCCAAC CCGTTCATG TGCTCGCCGA GCGGCATAA ATCGCCGTGA
 5581 CGATCAGCGG TCCAGTGATC GAAGTTAGGC TGTAAGAGC CGCGAGCGAT CCTTGAAGCT
 5641 GTCCCTGATG GTCGTCATCT ACCTGCCTGG ACAGCATGGC CTGCAACGCG GGCATCCCGA
 5701 TGCCGCCGGA AGCGAGAAGA ATCATAATGG GGAAGGCCAT CCAGCCTCGC GTCGCGAACG
 5761 CCAGCAAGAC GTAGCCCAGC GCGTCGGCCG CCATGCCGGC GATAATGGCC TGCTTCTCGC
 5821 CGAAACGTTT GGTGGCGGGA CCAGTGACGA AGGCTTGAGC GAGGGCGTGC AAGATTCCGA
 5881 ATACCGCAAG CGACAGGCCG ATCATCGTCG CGCTCCAGCG AAAGCGGTCC TCGCCGAAAA
 5941 TGACCCAGAG CGCTGCCGGC ACCTGTCCTA CGAGTTGCAT GATAAAGAAG ACAGTCATAA
 6001 GTGCGGCGAC GATAGTCATG CCCC GCGCCC ACCGGAAGGA GCTGACTGGG TTGAAGGCTC
 6061 TCAAGGGCAT CGGTGATCG ACGCTCTCCC TTATGCGACT CCTGCATTAG GAAGCAGCCC
 6121 AGTAGTAGGT TGAGGCCGTT GAGCACCGCC GCCGCAAGGA ATGGTGCATG CAAGGAGATG-

Figure 43C

6181 GCGCCCAACA GTCCCCGGC CACGGGGCCT GCCACCATAC CCACGCCGAA ACAAGCGCTC
6241 ATGAGCCCGA AGTGGCGAGC CCGA

FIGURE 43D

pDEST24

GST carboxy-fusion vector, T7 promoter

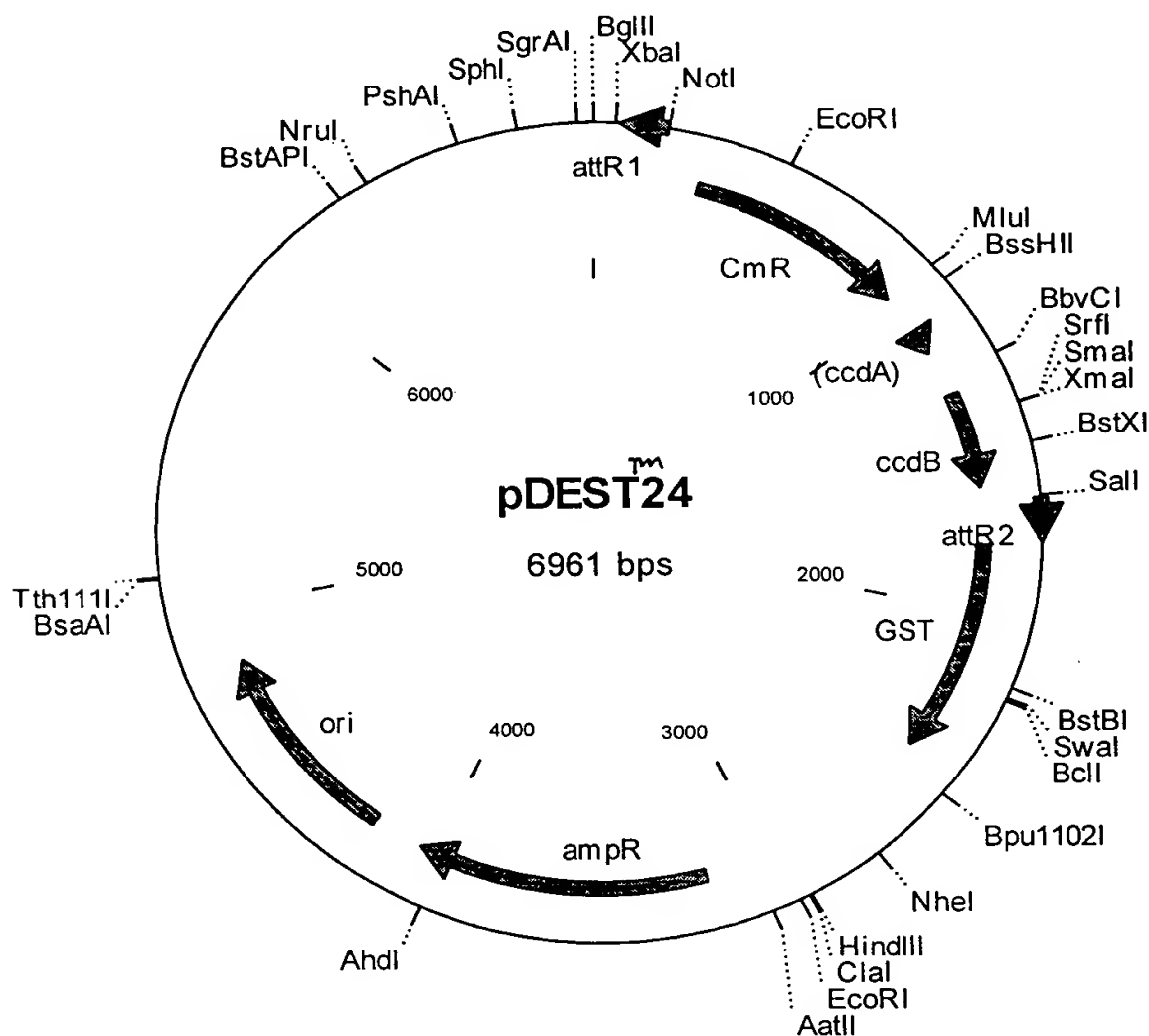
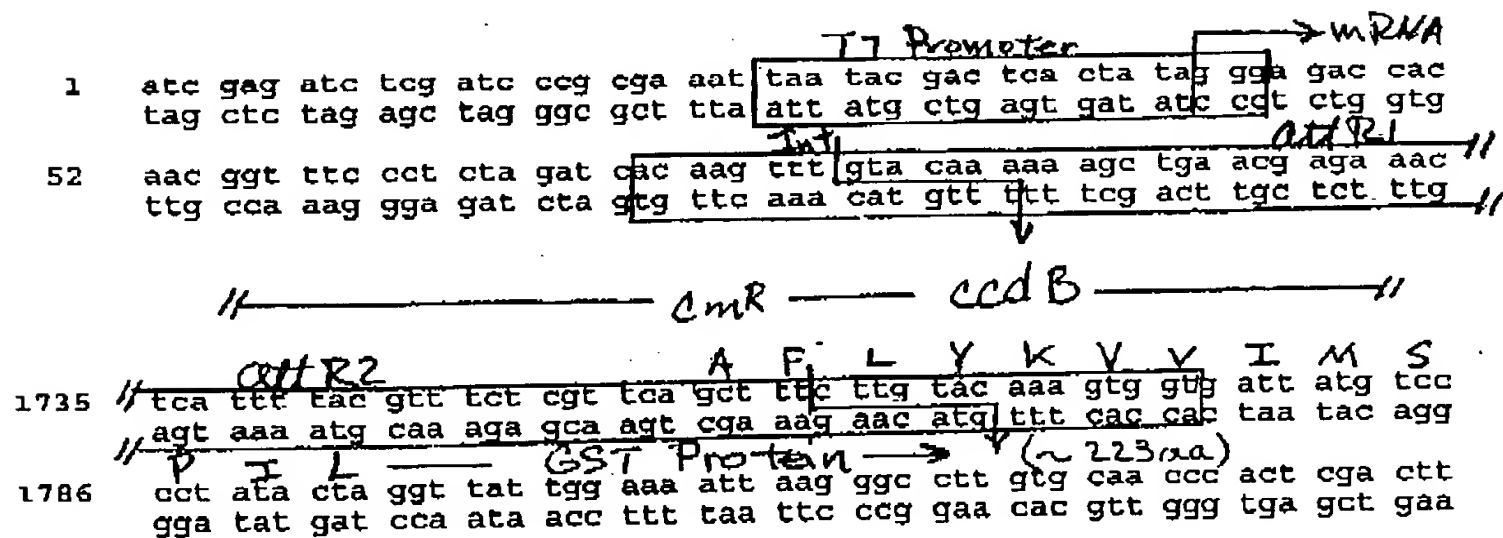


FIGURE 44A

pDEST24 6961 bp

Location (Base Nos.)	Gene Encoded
195..71	attR1
304..963	CmR
1083..1167	inactivated ccdA
1305..1610	ccdB
1651..1775	attR2
1783..2451	GST
3181..4041	ampR
4190..4829	ori

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1 ATCGAGATCT CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC
61 CCTCTAGATC ACAAGTTTGT AAAAAAAGC TGAACGAGAA ACGTAAAATG ATATAAATAT
121 CAATATATTA AATTAGATT TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA
181 TATCCAGTCA CTATGGCGGC CGCATTAGGC ACCCCAGGCT TTACACTTTA TGCTTCCGGC
241 TCGTATAATG TGTGGATTTT GAGTTAGGAT CCGGCGAGAT TTTCAGGAGC TAAGGAAGCT
301 AAAATGGAGA AAAAAATCAC TGGATATACC ACCGTTGATA TATCCCAATG GCATCGTAAA
361 GAACATTTTG AGGCATTTCA GTCAGTTGCT CAATGTACCT ATAACCAGAC CGTTCAGCTG
421 GATATTACGG CCTTTTAAA GACCGTAAAG AAAAATAAGC ACAAGTTTAA TCCGGCCTTT
481 ATTCACATTC TTGCCCCGCT GATGAATGCT CATCCGGAAT TCCGTATGGC AATGAAAGAC
541 GGTGAGCTGG TGATATGGGA TAGTGTTTAC CCTTGTTACA CCGTTTTCCA TGAGCAAAC
601 GAAACGTTTT CATCGCTCTG GAGTGAATAC CACGACGATT TCCGGCAGTT TCTACACATA
661 TATTCGCAAG ATGTGGCGTG TTACGGTGAA AACCTGGCCT ATTTCCCTAA AGGGTTTATT
721 GAGAATATGT TTTTCGTCTC AGCCAATCCC TGGGTGAGTT TCACCAGTTT TGATTTAAAC
781 GTGGCCAATA TGGACAACTT CTTCGCCCCC GTTTTCACCA TGGGCAAATA TTATACGCAA
841 GCGGACAAGG TGCTGATGCC GCTGGCGATT CAGGTTTCATC ATGCCGTCTG TGATGGCTTC
901 CATGTCGGCA GAATGCTTAA TGAATTACAA CAGTACTGCG ATGAGTGGCA GGGCGGGGCG
961 TAAACGCGTG GATCCGGCTT ACTAAAAGCC AGATAACAGT ATGCGTATTT GCGCGCTGAT
1021 TTTTGCGGTA TAAGAATATA TACTGATATG TATACCCGAA GTATGTCAA AAGAGGTGTG
1081 CTATGAAGCA GCGTATTACA GTGACAGTTG ACAGCGACAG CTATCAGTTG CTCAAGGCAT
1141 ATATGATGTC AATATCTCCG GTCTGGTAAG CACAACCATG CAGAATGAAG CCCGTCGTCT
1201 GCGTGCCGAA CGCTGGAAAG CGGAAAATCA GGAAGGGATG GCTGAGGTCG CCCGTTTAT
1261 TGAAATGAAC GGCTCTTTTG CTGACGAGAA CAGGGACTGG TGAAATGCAG TTTAAGGTTT
1321 ACACCTATAA AAGAGAGAGC CGTTATCGTC TGTTTGTGGA TGTACAGAGT GATATTATTG
1381 ACACGCCCCG GCGACGGATG GTGATCCCCC TGGCCAGTGC ACGTCTGCTG TCAGATAAAG
1441 TCTCCCGTGA ACTTTACCCG GTGGTGATA TCGGGGATGA AAGCTGGCGC ATGATGACCA
1501 CCGATATGGC CAGTGTGCCG GTCTCCGTTA TCGGGGAAGA AGTGGCTGAT CTCAGCCACC
1561 GCGAAAATGA CATCAAAAC GCCATTAACC TGATGTTCTG GGGAATATAA ATGTCAGGCT
1621 CCCTTATACA CAGCCAGTCT GCAGGTCGAC CATAGTGAAT GGATATGTTG TGTTTTACAG
1681 TATTATGTAG TCTGTTTTTT ATGCAAAATC TAATTTAATA TATTGATATT TATATCATTT
1741 TACGTTTCTC GTTCAGCTTT CTTGTACAAA GTGGTGATTA TGTCCCCTAT ACTAGGTTAT
1801 TGGAAAATTA AGGGCCTTGT GCAACCCACT CGACTTCTTT TGGAATATCT TGAAGAAAAA
1861 TATGAAGAGC ATTTGTATGA GCGCGATGAA GGTGATAAAT GCGGAAACAA AAAGTTTGAA
1921 TTGGGTTTGG AGTTTCCCAA TCTTCCTTAT TATATTGATG GTGATGTTAA ATTAACACAG
1981 TCTATGGCCA TCATACGTTA TATAGCTGAC AAGCACAACA TGTTGGGTGG TTGTCCAAAA
2041 GAGCGTGCAG AGATTTCAAT GCTTGAAGGA GCGGTTTTGG ATATTAGATA CGGTGTTCG
2101 AGAATTGCAT ATAGTAAAGA CTTTGAAACT CTCAAAGTTG ATTTTCTTAG CAAGCTACCT
2161 GAAATGCTGA AAATGTTTGA AGATCGTTTA TGTCAATAAA CATATTTAAA TGGTGATCAT
2221 GTAACCCATC CTGACTTCAT GTTGTATGAC GCTCTTGATG TTGTTTTATA CATGGACCCA
2281 ATGTGCCTGG ATGCGTTCCC AAAATTAGTT TGTTTTAAAA AACGTATTGA AGCTATCCCA
2341 CAAATTGATA AGTACTTGAA ATCCAGCAAG TATATAGCAT GGCCTTTGCA GGGCTGGCAA
2401 GCCACGTTTG GTGGTGGCGA CCATCCTCCA AAATCGGATC TGGTTCCGCG TCCATGGGGA
2461 TCCGGCTGCT AACAAAGCCC GAAAGGAAGC TGAGTTGGCT GCTGCCACCG CTGAGCAATA
2521 ACTAGCATAA CCCCTTGGGG CCTCTAAACG GGTCTTGAGG GGTTTTTTGC TGAAAGGAGG
2581 AACTATATCC GGATATCCAC AGGACGGGTG TGGTCGCCAT GATCGCGTAG TCGATAGTGG
2641 CTCCAAGTAG CGAAGCGAGC AGGACTGGGC GGCGGCCAAA GCGGTCGGAC AGTGCTCCGA—

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FIGURE 44B

2701 GAACGGGTGC GCATAGAAAT TGCATCAACG CATATAGCGC TAGCAGCACG CCATAGTGAC
2761 TGGCGATGCT GTCGGAATGG ACGATATCCC GCAAGAGGCC CGGCAGTACC GGCATAACCA
2821 AGCCTATGCC TACAGCATCC AGGGTGACGG TGCCGAGGAT GACGATGAGC GCATTGTTAG
2881 ATTTCATACA CGGTGCCTGA CTGCGTTAGC AATTTAACTG TGATAAACTA CCGCATTA
2941 GCTTATCGAT GATAAGCTGT CAAACATGAG AATTCTTGAA GACGAAAGGG CCTCGTGATA
3001 CGCCTATTTT TATAGGTAA TGTCATGATA ATAATGGTTT CTTAGACGTC AGGTGGCACT
3061 TTTCGGGGAA ATGTGCGCGG AACCCCTATT TGTTTATTTT TCTAAATACA TTCAAATATG
3121 TATCCGCTCA TGAGACAATA ACCCTGATAA ATGCTTCAAT AATATTGAAA AAGGAAGAGT
3181 ATGAGTATTC AACATTTCCG TGTCGCCCTT ATTCCCTTTT TTGCGGCATT TTGCCTTCCT
3241 GTTTTTGCTC ACCCAGAAAC GCTGGTGAAA GTAAAAGATG CTGAAGATCA GTTGGGTGCA
3301 CGAGTGGGT ACATCGAACT GGATCTCAAC AGCGGTAAGA TCCTTGAGAG TTTTCGCCCC
3361 GAAGAACGTT TTCCAATGAT GAGCACTTTT AAAGTTCTGC TATGTGGCGC GGTATTATCC
3421 CGTGTGACG CCGGGCAAGA GCAACTCGGT CGCCGCATAC ACTATTCTCA GAATGACTTG
3481 GTTGAGTACT CACCAGTCAC AGAAAAGCAT CTTACGGATG GCATGACAGT AAGAGAATTA
3541 TGCAGTGCTG CCATAACCAT GAGTGATAAC ACTGCGGCCA ACTTACTTCT GACAACGATC
3601 GGAGGACCGA AGGAGCTAAC CGCTTTTTTG CACAACATGG GGGATCATGT AACTCGCCTT
3661 GATCGTTGGG AACCGGAGCT GAATGAAGCC ATACCAAACG ACGAGCGTGA CACCACGATG
3721 CCTGCAGCAA TGGCAACAAC GTTGCGCAA CTATTAAC TGCGAACTACT TACTCTAGCT
3781 TCCCGGCAAC AATTAATAGA CTGGATGGAG GCGGATAAAG TTGCAGGACC ACTTCTGCGC
3841 TCGGCCCTTC CGGCTGGCTG GTTTATTGCT GATAAATCTG GAGCCGGTGA GCGTGGGTCT
3901 CGCGGTATCA TTGCAGCACT GGGGCCAGAT GGTAAGCCCT CCCGTATCGT AGTTATCTAC
3961 ACGACGGGGA GTCAGGCAAC TATGGATGAA CGAAATAGAC AGATCGCTGA GATAGGTGCC
4021 TCACTGATTA AGCATTGGTA ACTGTCAGAC CAAGTTTACT CATATATACT TTAGATTGAT
4081 TTAAAACTTC ATTTTAAAT TAAAAGGATC TAGGTGAAGA TCCTTTTTGA TAATCTCATG
4141 ACCAAAATCC CTTAACGTGA GTTTTCGTTC CACTGAGCGT CAGACCCCGT AGAAAAGATC
4201 AAAGGATCTT CTTGAGATCC TTTTTTCTG CGCGTAATCT GCTGCTTGCA AACAAAAA
4261 CCACCGCTAC CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT TTTTCCGAAG
4321 GTAACGGCT TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTAGTGTA GCCGTAGTTA
4381 GGCCACCACT TCAAGAACTC TGTCAGACCG CCTACATACC TCGCTCTGCT AATCCTGTTA
4441 CCAGTGGCTG CTGCCAGTGG CGATAAGTCG TGCTTTACCG GGTTGGACTC AAGACGATAG
4501 TTACCGGATA AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGACACA GCCCAGCTTG
4561 GAGCGAACGA CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA AAGCGCCACG
4621 CTTCCCGAAG GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCGG AACAGGAGAG
4681 CGCACGAGGG AGCTTCCAGG GGGAAACGCC TGGTATCTTT ATAGTCCTGT CGGGTTTCGC
4741 CACCTCTGAC TTGAGCGTCG ATTTTGTGA TGCTCGTCAG GGGGGCGGAG CCTATGGAAA
4801 AACGCCAGCA ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT TGCTCACATG
4861 TTCTTTCCTG CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCCTT TGAGTGAGCT
4921 GATACCGCTC GCCGCAGCCG AACGACCGAG CGCAGCGAGT CAGTGAGCGA GGAAGCGGAA
4981 GAGCGCCTGA TGCGGTATTT TCTCCTTACG CATCTGTGCG GTATTTTACA CCGCATATAT
5041 GGTGCACTCT CAGTACAATC TGCTCTGATG CCGCATAGTT AAGCCAGTAT AACTCCGCT
5101 ATCGCTACGT GACTGGGTCA TGGCTGCGCC CCGACACCCG CCAACACCCG CTGACGCGCC
5161 CTGACGGGCT TGTCTGCTCC CGGCATCCGC TTACAGACAA GCTGTGACCG TCTCCGGGAG
5221 CTGCATGTGT CAGAGGTTTT CACCGTCATC ACCGAAACGC GCGAGGCAGC TGCGGTAAAG
5281 CTCATCAGCG TGGTCGTGAA GCGATTACA GATGTCTGCC TGTTTATCCG CGTCCAGCTC
5341 GTTGAGTTTC TCCAGAAGCG TTAATGTCTG GCTTCTGATA AAGCGGGCCA TGTTAAGGGC
5401 GGTTTTTTCC TGTTTGGTCA CTGATGCCTC CGTGTAAGGG GGATTTCTGT TCATGGGGGT
5461 AATGATACCG ATGAAACGAG AGAGGATGCT CACGATACGG GTTACTGATG ATGAACATGC
5521 CCGGTTACTG GAACGTTGTG AGGGTAAACA ACTGGCGGTA TGGATGCGGC GGGACCAGAG
5581 AAAAATCACT CAGGGTCAAT GCCAGCGCTT CGTTAATACA GATGTAGGTG TTCCACAGGG
5641 TAGCCAGCAG CATCCTGCGA TGCAGATCCG GAACATAATG GTGCAGGGCG CTGACTTCCG
5701 CGTTTCCAGA CTTTACGAAA CACGGAAACC GAAGACCATT CATGTTGTTG CTCAGGTGCG
5761 AGACGTTTTG CAGCAGCAGT CGCTTCACGT TCGCTCGCGT ATCGGTGATT CATTCTGCTA
5821 ACCAGTAAGG CAACCCCGCC AGCCTAGCCG GGTCCTCAAC GACAGGAGCA CGATCATGCG
5881 CACCCGTGGC CAGGACCCAA CGCTGCCCGA GATGCGCCGC GTGCGGCTGC TGGAGATGGC
5941 GGACGCGATG GATATGTTCT GCCAAGGGTT GGTTTGCGCA TTCACAGTTC TCCGCAAGAA
6001 TTGATTGGCT CCAATTCTTG GAGTGGTGAA TCCGTTAGCG AGGTGCCGCC GGCTTCCATT
6061 CAGGTGAGG TGGCCCGGCT CCATGCACCG CGACGCAACG CGGGGAGGCA GACAAGGTAT
6121 AGGGCGGCGC CTACAATCCA TGCCAACCCG TTCCATGTGC TCGCCGAGGC GGCATAAATC

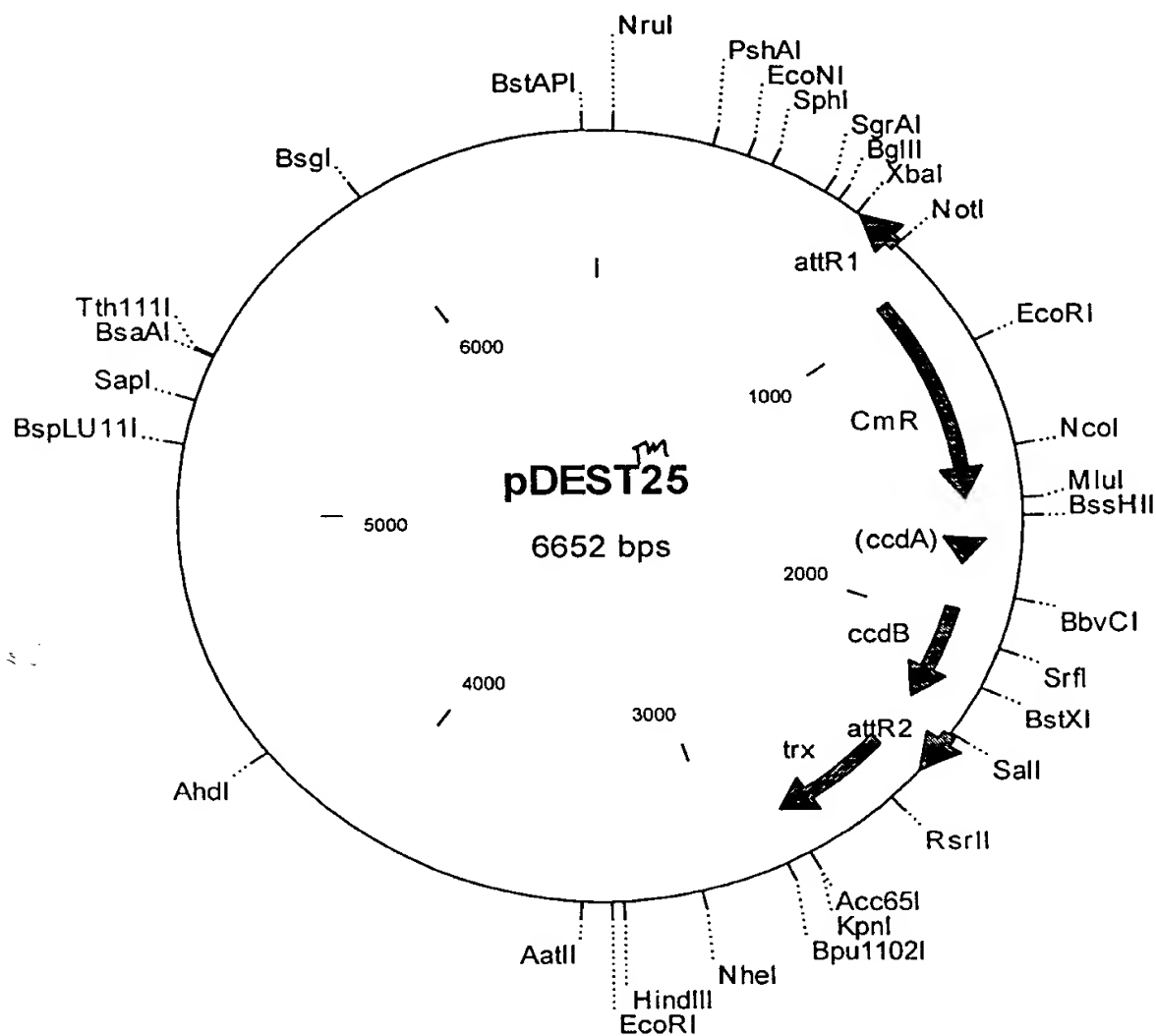
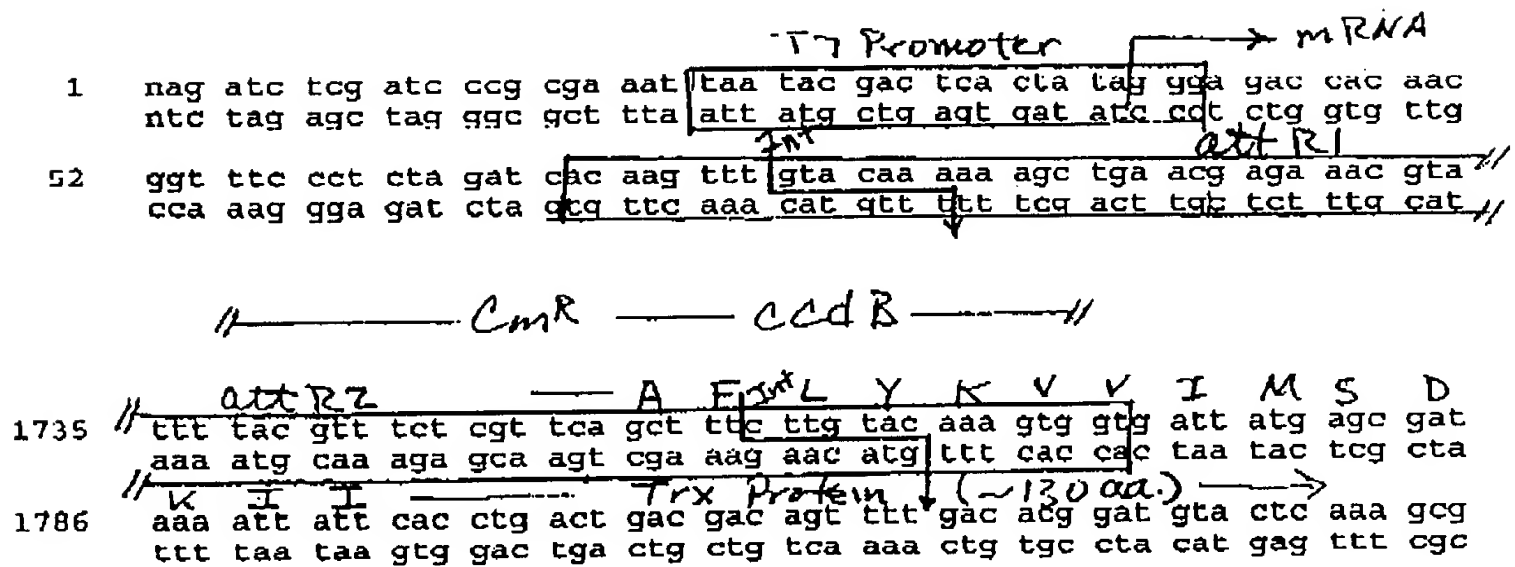
FIGURE 44C

6181 GCCGTGACGA TCAGCGGTCC AGTGATCGAA GTTAGGCTGG TAAGAGCCGC GAGCGATCCT
 6241 TGAAGCTGTC CCTGATGGTC GTCATCTACC TGCCTGGACA GCATGGCCTG CAACGCGGGC
 6301 ATCCCGATGC CGCCGGAAGC GAGAAGAATC ATAATGGGGA AGGCCATCCA GCCTCGCGTC
 6361 GCGAACGCCA GCAAGACGTA GCCCAGCGCG TCGGCCGCCA TGCCGGCGAT AATGGCCTGC
 6421 TTCTCGCCGA AACGTTTGGT GGCGGGACCA GTGACGAAGG CTTGAGCGAG GGCGTGCAAG
 6481 ATTCCGAATA CCGCAAGCGA CAGGCCGATC ATCGTCGCGC TCCAGCGAAA GCGGTCCTCG
 6541 CCGAAAATGA CCCAGAGCGC TGCCGGCACC TGTCCTACGA GTTGCATGAT AAAGAAGACA
 6601 GTCATAAGTG CGGCGACGAT AGTCATGCCC CGCGCCCACC GGAAGGAGCT GACTGGGTTG
 6661 AAGGCTCTCA AGGGCATCGG TCGATCGACG CTCTCCCTTA TGCGACTCCT GCATTAGGAA
 6721 GCAGCCAGT AGTAGGTGA GGCCGTTGAG CACCGCCGCC GCAAGGAATG GTGCATGCAA
 6781 GGAGATGGCG CCCAACAGTC CCCCGGCCAC GGGGCCTGCC ACCATACCCA CGCCGAAACA
 6841 AGCGCTCATG AGCCCGAAGT GGCGAGCCCG ATCTTCCCCA TCGGTGATGT CGGCGATATA
 6901 GCGGCCAGCA ACCGCACCTG TGGCGCCGGT GATGCCGGCC ACGATGCGTC CGGCGTAGAG
 6961 G

FIGURE 44D

FIGURE 45A

pDEST25 Thioredoxin carboxy-fusion vector, T7 promoter



pDEST25 6652 bp

Location (Base Nos.)	Gene Encoded
844..720	attR1
953..1612	CmR
1732..1816	inactivated ccdA
1954..2259	ccdB
2300..2424	attR2
2432..2794	trx

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1 CCGGAAGCGA GAAGAATCAT AATGGGGAAG GCCATCCAGC CTCGCGTCGC GAACGCCAGC
61 AAGACGTAGC CCAGCGCGTC GGCCGCCATG CCGGCGATAA TGGCCTGCTT CTCGCCGAAA
121 CGTTTGGTGG CGGGACCAGT GACGAAGGCT TGAGCGAGGG CGTGCAAGAT TCCGAATACC
181 GCAAGCGACA GGCCGATCAT CGTCGCGCTC CAGCGAAAGC GGTCCTCGCC GAAAATGACC
241 CAGAGCGCTG CCGGCACCTG TCCTACGAGT TGCATGATAA AGAAGACAGT CATAAGTGCG
301 GCGACGATAG TCATGCCCCG CGCCCACCGG AAGGAGCTGA CTGGGTTGAA GGCTCTCAAG
361 GGCATCGGTC GATCGACGCT CTCCCTTATG CGACTCCTGC ATTAGGAAGC AGCCCAGTAG
421 TAGGTTGAGG CCGTTGAGCA CCGCCGCCGC AAGGAATGGT GCATGCAAGG AGATGGCGCC
481 CAACAGTCCC CCGGCCACGG GGCCTGCCAC CATACCCACG CCGAAACAAG CGCTCATGAG
541 CCCGAAGTGG CGAGCCCCGAT CTTCCCCATC GGTGATGTCG GCGATATAGG CGCCAGCAAC
601 CGCACCTGTG GCGCCGGTGA TGCCGGCCAC GATGCGTCCG GCGTAGAGGA TCGAGATCTC
661 GATCCCGCGA AATTAATACG ACTCACTATA GGGAGACCAC AACGGTTTCC CTCTAGATCA
721 CAAGTTTGTA CAAAAAAGCT GAACGAGAAA CGTAAAATGA TATAAATATC AATATATTAA
781 ATTAGATTTT GCATAAAAAA CAGACTACAT AATACTGTAA AACACAACAT ATCCAGTCAC
841 TATGGCGGCC GCATTAGGCA CCCAGGCTT TACACTTTAT GCTTCCGGCT CGTATAATGT
901 GTGGATTTTG AGTTAGGATC CGGCGAGATT TTCAGGAGCT AAGGAAGCTA AAATGGAGAA
961 AAAAATCACT GGATATACCA CCGTTGATAT ATCCCAATGG CATCGTAAAG AACATTTTGA
1021 GGCATTTTCA TCAGTTGCTC AATGTACCTA TAACCAGACC GTTCAGCTGG ATATTACGGC
1081 CTTTTTAAAG ACCGTAAAGA AAAATAAGCA CAAGTTTATAT CCGGCCTTTA TTCACATTCT
1141 TGCCCGCCTG ATGAATGCTC ATCCGGAATT CCGTATGGCA ATGAAAGACG GTGAGCTGGT
1201 GATATGGGAT AGTGTTTACC CTTGTTACAC CGTTTTCCAT GAGCAAACCTG AAACGTTTTT
1261 ATCGCTCTGG AGTGAATACC ACGACGATTT CCGGCAGTTT CTACACATAT ATTCGCAAGA
1321 TGTGGCGTGT TACGGTGAAA ACCTGGCCTA TTTCCCTAAA GGGTTTATTG AGAATATGTT
1381 TTTCGTCTCA GCCAATCCCT GGGTGAGTTT CACCAGTTTT GATTTAAACG TGGCCAATAT
1441 GGACAACCTC TTCGCCCCCG TTTTCACCAT GGGCAAATAT TATACGCAAG GCGACAAGGT
1501 GCTGATGCCG CTGGCGATTC AGGTTTCATCA TGCCGTCTGT GATGGCTTCC ATGTCGGCAG
1561 AATGCTTAAT GAATTACAAC AGTACTGCGA TGAGTGGCAG GGCGGGGCGT AAACGCGTGG
1621 ATCCGGCTTA CTAAAAGCCA GATAACAGTA TGCATATTG CGCGCTGATT TTTGCGGTAT
1681 AAGAATATAT ACTGATATGT ATACCCGAAG TATGTCAAAA AGAGGTGTGC TATGAAGCAG
1741 CGTATTACAG TGACAGTTGA CAGCGACAGC TATCAGTTGC TCAAGGCATA TATGATGTCA
1801 ATATCTCCGG TCTGGTAAGC ACAACCATGC AGAATGAAGC CCGTCGTCTG CGTGCCGAAC
1861 GCTGGAAAGC GGAAAATCAG GAAGGGATGG CTGAGGTTCGC CCGGTTTATT GAAATGAACG
1921 GCTCTTTTGC TGACGAGAAC AGGGACTGGT GAAATGCAGT TTAAGGTTTA CACCTATAAA
1981 AGAGAGAGCC GTTATCGTCT GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCCGG
2041 CGACGGATGG TGATCCCCCT GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA
2101 CTTTACCCGG TGGTGATAT CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC
2161 AGTGTGCCGG TCTCCGTTAT CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC
2221 ATCAAAAACG CCATTAACCT GATGTTCTGG GGAATATAAA TGTCAGGCTC CCTTATACAC
2281 AGCCAGTCTG CAGGTCGACC ATAGTGAAGT GATATGTTGT GTTTTACAGT ATTATGTAGT
2341 CTGTTTTTTA TGCAAAATCT AATTTAATAT ATTGATATTT ATATCATTTT ACGTTTCTCG
2401 TTCAGCTTTC TTGTACAAAG TGGTGATTAT GAGCGATAAA ATTATTCACC TGACTGACGA
2461 CAGTTTTTGAC ACGGATGTAC TCAAAGCGGA CGGGGCGATC CTCGTGCTGATT TCTGGGCAGA
2521 GTGGTGCGGT CCGTGCAAAA TGATCGCCCC GATTCTGGAT GAAATCGCTG ACGAATATCA
2581 GGGCAAACCT ACCGTTGCAA AACTGAACAT CGATCAAAAC CCTGGCACTG CGCCGAAATA
2641 TGGCATCCGT GGTATCCCGA CTCTGCTGCT GTTCAAAAAC GGTGAAGTGG CGGCAACCAA
2701 AGTGGGTGCA CTGTCTAAAG GTCAGTTGAA AGAGTTCCTC GACGCTAACC TGGCCGGTTC
2761 TGGTTCTGGT GATGACGATG ACAAGGTACC CGGGGATCGA TCCGGCTGCT AACAAAGCCC

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Figure 45B

6301 GCCAAGGGTT GGT TTGCGCA TTCACAGTTC TCCGCAAGAA TTGATTGGCT CCAATTCTTG
6361 GAGTGGTGAA TCCGTTAGCG AGGTGCCGCC GGCTTCCATT CAGGTCGAGG TGGCCCGGCT
6421 CCATGCACCG CGACGCAACG CGGGGAGGCA GACAAGGTAT AGGGCGGCGC CTACAATCCA
6481 TGCCAACCCG TTCCATGTGC TCGCCGAGGC GGCATAAATC GCCGTGACGA TCAGCGGTCC
6541 AGTGATCGAA GTTAGGCTGG TAAGAGCCGC GAGCGATCCT TGAAGCTGTC CCTGATGGTC
6601 GTCATCTACC TGCCTGGACA GCATGGCCTG CAACGCGGGC ATCCCGATGC CG

FIGURE 45D



600 ttg acg tca atg gga gtt tgt ttt ggc acc aaa atc aac ggg act ttc caa
aac tgc agt tac cct caa aca aaa ccg tgg ttt tag ttg ccc tga aag gtt

651 aat gtc gta aca act ccg ccc cat tga cgc aaa tgg gcg gta ggc gtg tac
tta cag cat tgt tga ggc ggg gta act gcg ttt acc cgc cat ccg cac atg

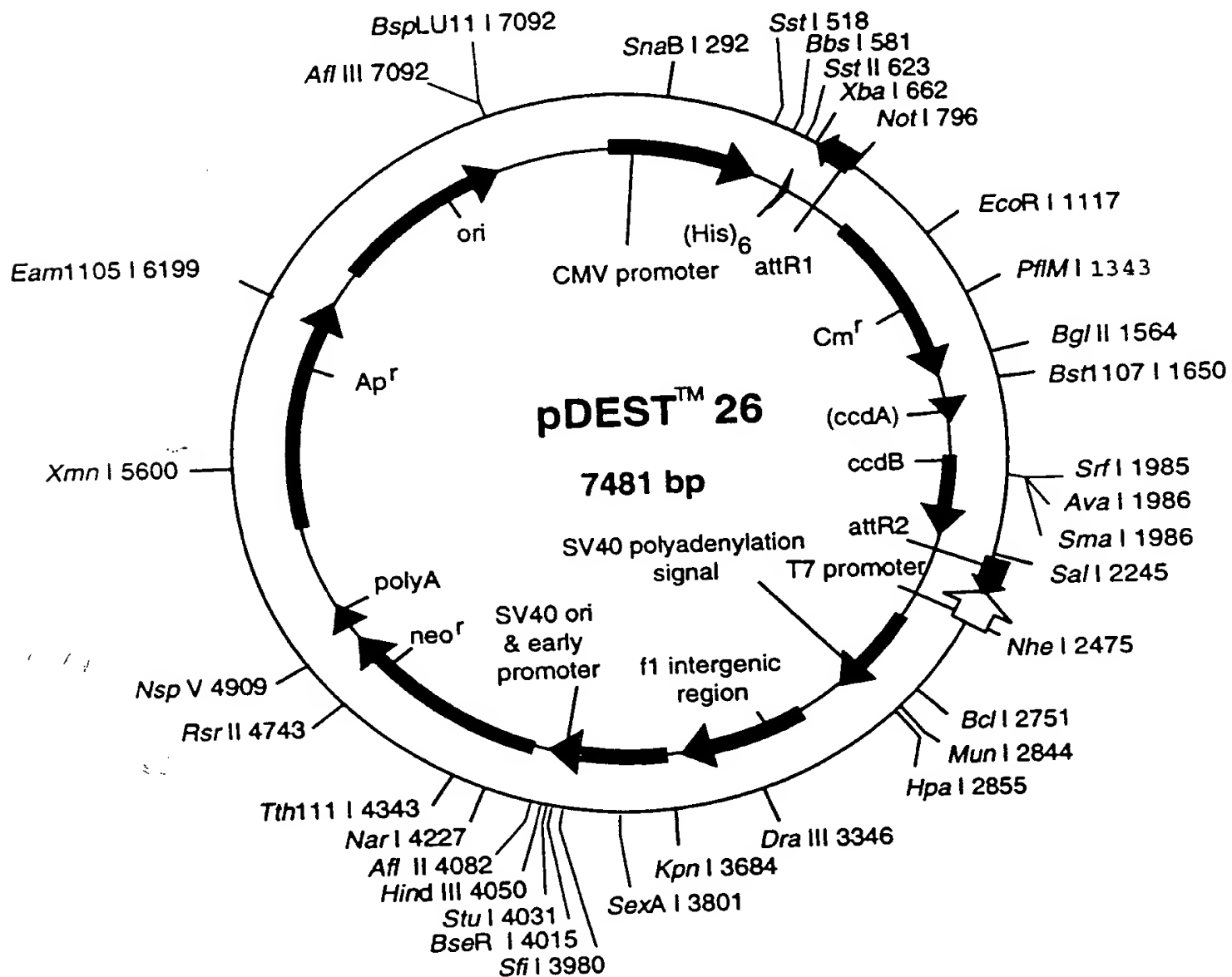
702 // ggt ggg agg tct ata taa goa gag ctg gtt tag tga acc gtc aga tgc cct
// cca ccc tcc aga tat att cgt ctg gag caa atc act tgg cag tct agc gga

753 gga gac gcc atc cac gct gtt ttg acc tcc ata gaa gac acc ggg acc gat
cct ctg cgg tag gtg cga caa aac tgg agg tat ctt ctg tgg ccc tgg cta

804 cca gcc tcc gga ctg tag cct agg ccg cgg acc atg gcg tac tac cat cac
ggg cgg agg cct gag atc gga tcc ggc gcc tgg tac cgc atg atg gta gtg

855 H M H H S R S T S I V K K A CAGT24//
cat cac cat cac tct aga tca aca agt ttg tac aaa aaa gct gaa cga gaa
gta gtg gta gtg aga tct agt tgt tca aac atg ttt ttt cga ott gct ctt

Int Y



pDEST26 7481 bp

Location (Base Nos.)

Gene Encoded

492..509	his6
619..519	attR1
752..1411	CmR
1531..1615	inactivated ccdA
1753..2058	ccdB
2099..2223	attR2
2409..2771	SV40 polyA
2966..3421	f1 intergenic region
3485..3903	SV40 promoter
3948..4742	neo
4806..4854	polyA
5265..6125	Apr
6274..6913	ori
7344..385	CMV promoter

1 GTAAACTGCC CACTTGGCAG TACATCAAGT GTATCATATG CCAAGTACGC CCCCTATTGA
61 CGTCAATGAC GGTAATGGC CCGCCTGGCA TTATGCCCAG TACATGACCT TATGGGACTT
121 TCCTACTTGG CAGTACATCT ACGTATTAGT CATCGCTATT ACCATGGTGA TGC GGTTTGTG
181 GCAGTACATC AATGGGCGTG GATAGCGGTT TGACTCACGG GGATTTCCTA GTCTCCACCC
241 CATTGACGTC AATGGGAGTT TGT TTTGGCA CCAAATCAA CGGGACTTTC CAAATGTCTG
301 TAACAACTCC GCCCATTTGA CGCAAATGGG CGGTAGGCGT GTACGGTGGG AGGTCTATAT
361 AAGCAGAGCT CGTTTAGTGA ACCGTCAGAT CGCCTGGAGA CGCCATCCAC GCTGTTTTGA
421 CCTCCATAGA AGACACCGGG ACCGATCCAG CCTCCGGACT CTAGCCTAGG CCGCGGACCA
481 TGGCGTACTA CCATCACCAT CACCATCACT CTAGATCAAC AAGTTTGTAC AAAAAAGCTG
541 AACGAGAAAC GTAAATGAT ATAAATATCA ATATATTAAA TTAGATTTTG CATAAAAAAC
601 AGACTACATA ATACTGTAAA ACACAACATA TCCAGTCACT ATGGCGGCCG CATTAGGCAC
661 CCCAGGCTTT ACAC TTTATG CTTCCGGCTC GTATAATGTG TGGATTTTGA GTTAGGATCC
721 GGCGAGATTT TCAGGAGCTA AGGAAGCTAA AATGGAGAAA AAAATCACTG GATATACCAC
781 CGTTGATATA TCCAATGGC ATCGTAAAGA ACATTTTGAG GCATTTTCAGT CAGTTGCTCA
841 ATGTACCTAT AACCAGACCG TTCAGCTGGA TATTACGGCC TTTTTAAAGA CCGTAAAGAA
901 AAATAAGCAC AAGTTTTATC CGGCCTTTAT TCACATTCTT GCCCGCCTGA TGAATGCTCA
961 TCCGGAATTC CGTATGGCAA TGAAAGACGG TGAGCTGGTG ATATGGGATA GTGTTACCCC
1021 TTGTTACACC GTTTTCCATG AGCAAACCTGA AACGTTTTCA TCGCTCTGGA GTGAATACCA
1081 CGACGATTTT CGGCAGTTTC TACACATATA TTCGCAAGAT GTGGCGTGTT ACGGTGAAAA
1141 CCTGGCCTAT TTCCCTAAAG GGTTTATTGA GAATATGTTT TTCGTCTCAG CCAATCCCTG
1201 GGTGAGTTTC ACCAGTTTTG ATTTAAACGT GGCCAATATG GACAACTTCT TCGCCCCCGT
1261 TTTACCATG GGCAAATATT ATACGCAAGG CGACAAGGTG CTGATGCCGC TGGCGATTCA
1321 GGTTTCATCAT GCCGTCTGTG ATGGCTTCCA TGTCGGCAGA ATGCTTAATG AATTACAACA
1381 GTAGTGCAT GAGTGGCAGG GCGGGGCGTA AAGATCTGGA TCCGGCTTAC TAAAAGCCAG
1441 ATAACAGTAT GCGTATTTGC GCGCTGATTT TTGCGGTATA AGAATATATA CTGATATGTA
1501 TACCCGAAGT ATGTCAAAAA GAGGTGTGCT ATGAAGCAGC GTATTACAGT GACAGTTGAC
1561 AGCGACAGCT ATCAGTTGCT CAAGGCATAT ATGATGTCAA TATCTCCGGT CTGGTAAGCA
1621 CAACCATGCA GAATGAAGCC CGTCGTCTGC GTGCCGAACG CTGGAAAGCG GAAAATCAGG
1681 AAGGGATGGC TGAGGTCGCC CGGTTTATTG AAATGAACGG CTCTTTTGCT GACGAGAACA
1741 GGGACTGGTG AAATGCAGTT TAAGGTTTAC ACCTATAAAA GAGAGAGCCG TTATCGTCTG
1801 TTTGTGGATG TACAGAGTGA TATTATTGAC ACGCCCGGGC GACGGATGGT GATCCCCCTG
1861 GCCAGTGCAC GTCTGCTGTC AGATAAAGTC TCCCGTGAAC TTTACCCGGT GGTGCATATC
1921 GGGGATGAAA GCTGGCGCAT GATGACCACC GATATGGCCA GTGTGCCGGT CTCCGTTATC
1981 GGGGAAGAAG TGGCTGATCT CAGCCACCGC GAAAATGACA TCAAAAACGC CATTAACTG
2041 ATGTTCTGGG GAATATAAAT GTCAGGCTCC CTTATACACA GCCAGTCTGC AGGTGACCA
2101 TAGTGACTGG ATATGTTGTG TTTTACAGTA TTATGTAGTC TGTTTTTTAT GCAAAATCTA
2161 ATTTAATATA TTGATATTTA TATCATTTTA CGTTTCTCGT TCAGCTTTCT TGTACAAAGT
2221 GGTTGATCGC GTGCATGCGA CGTCATAGCT CTCTCCCTAT AGTGAGTCGT ATTATAAGCT
2281 AGGCACTGGC CGTCGTTTTA CAACGTCGTG ACTGGGAAAA CTGCTAGCTT GGGATCTTTG -

Figure 46B

2341 TGAAGGAACC TTACTTCTGT GGTGTGACAT AATTGGACAA ACTACCTACA GAGATTTAAA
2401 GCTCTAAGGT AAATATAAAA TTTTAAAGTG TATAATGTGT TAAACTAGCT GCATATGCTT
2461 GCTGCTTGAG AGTTTTGCTT ACTGAGTATG ATTTATGAAA ATATTATACA CAGGAGCTAG
2521 TGATTCTAAT TGTTTGTGTA TTTTAGATTC ACAGTCCCAA GGCTCATTTT AGGCCCTCA
2581 GTCCTCACAG TCTGTTTCATG ATCATAATCA GCCATACCAC ATTTGTAGAG GTTTTACTTG
2641 CTTTAAAAAA CCTCCCACAC CTCCCCCTGA ACCTGAAACA TAAAATGAAT GCAATTGTTG
2701 TTGTTAACTT GTTTATTGCA GCTTATAATG GTTACAAATA AAGCAATAGC ATCACAAATT
2761 TCACAAATAA AGCATTTTTTT TCACTGCATT CTAGTTGTGG TTTGTCCAAA CTCATCAATG
2821 TATCTTATCA TGTCTGGATC GATCCTGCAT TAATGAATCG GCCAACGCGC GGGGAGAGGC
2881 GGTTCGCGTA TTGGCTGGCG TAATAGCGAA GAGGCCCGCA CCGATCGCCC TTCCCAACAG
2941 TTGCGCAGCC TGAATGGCGA ATGGGACGCG CCCTGTAGCG GCGCATTAAG CGCGGCGGGT
3001 GTGGTGGTTA CGCGCAGCGT GACCGCTACA CTGCCCAGCG CCCTAGCGCC CGCTCCTTTC
3061 GCTTTCTTCC CTTCTTTTCT CGCCACGTTT GCCGGCTTTC CCCGTCAAGC TCTAAATCGG
3121 GGGCTCCCTT TAGGGTTCCG ATTTAGTGCT TTACGGCACC TCGACCCCAA AAAACTTGAT
3181 TAGGGTGATG GTTCACGTAG TGGGCCATCG CCCTGATAGA CGGTTTTTCG CCCTTTGACG
3241 TTGGAGTCCA CGTTCTTTAA TAGTGGACTC TTGTTCCAAA CTGGAACAAC ACTCAACCCT
3301 ATCTCGGTCT ATTCTTTTGA TTTATAAGGG ATTTTGCCGA TTTCGGCCTA TTGGTTAAAA
3361 AATGAGCTGA TTTAACAAAT ATTTAACGCG AATTTTAACA AAATATTAAC GTTTACAATT
3421 TCGCCTGATG CGGTATTTTC TCCTTACGCA TCTGTGCGGT ATTTACACACC GCATACGCGG
3481 ATCTGCGCAG CACCATGGCC TGAAATAACC TCTGAAAGAG GAACTTGTTT AGGTACCTTC
3541 TGAGGCGGAA AGAACCAGCT GTGGAATGTG TGTCAGTTAG GGTGTGGAAA GTCCCCAGGC
3601 TCCCCAGCAG GCAGAAGTAT GCAAAGCATG CATCTCAATT AGTCAGCAAC CAGGTGTGGA
3661 AAGTCCCCAG GCTCCCCAGC AGGCAGAAGT ATGCAAAGCA TGCATCTCAA TTAGTCAGCA
3721 ACCATAGTCC CGCCCCTAAC TCCGCCCATC CCGCCCCTAA CTCCGCCAG TTCCGCCCAT
3781 TCTCCGCCCC ATGGCTGACT AATTTTTTTT ATTTATGCAG AGGCCGAGGC CGCCTCGGCC
3841 TCTGAGCTAT TCCAGAAGTA GTGAGGAGGC TTTTTTGGAG GCCTAGGCTT TTGCAAAAAG
3901 CTTGATTCTT CTGACACAAC AGTCTCGAAC TTAAGGCTAG AGCCACCATG ATTGAACAAG
3961 ATGGATTGCA CGCAGGTTCCT CCGGCCGCTT GGGTGGAGAG GCTATTCCGC TATGACTGGG
4021 CACAACAGAC AATCGGCTGC TCTGATGCCG CCGTGTTCCT GCTGTCAGCG CAGGGGCGCC
4081 CGGTCTTTTT TGTCAAGACC GACCTGTCCG GTGCCCTGAA TGAAGTGCAG GACGAGGCAG
4141 CGCGGCTATC GTGGCTGGCC ACGACGGGCG TTCCTTGCGC AGCTGTGCTC GACGTTGTCA
4201 CTGAAGCGGG AAGGGACTGG CTGCTATTGG GCGAAGTGCC GGGGCAGGAT CTCCTGTCTAT
4261 CTCACCTTGC TCCTGCCGAG AAAGTATCCA TCATGGCTGA TGCAATGCGG CGGCTGCATA
4321 CGCTTGATCC GGCTACCTGC CCATTCGACC ACCAAGCGAA ACATCGCATC GAGCGAGCAC
4381 GTACTCGGAT GGAAGCCGGT CTTGTGATC AGGATGATCT GGACGAAGAG CATCAGGGGC
4441 TCGCGCCAGC CGAACTGTTT GCCAGGCTCA AGGCGCGCAT GCCCGACGGC GAGGATCTCG
4501 TCGTGACCCA TGGCGATGCC TGCTTGCCGA ATATCATGGT GGAAAATGGC CGCTTTTCTG
4561 GATTCATCGA CTGTGGCCGG CTGGGTGTGG CGGACCGCTA TCAGGACATA GCGTTGGCTA
4621 CCCGTGATAT TGCTGAAGAG CTTGGCGGCG AATGGGCTGA CCGCTTCCTC GTGCTTTACG
4681 GTATCGCCGC TCCCGATTCT CAGCGCATCG CCTTCTATCG CCTTCTTGAC GAGTTCTTCT
4741 GAGCGGGACT CTGGGGTTCG AAATGACCGA CCAAGCGACG CCCAACCTGC CATCACGATG
4801 GCCGCAATAA AATATCTTTA TTTTCATTAC ATCTGTGTGT TGGTTTTTTG TGTGAATCGA
4861 TAGCGATAAG GATCCGCGTA TGGTGCATCT TCAGTACAAT CTGCTCTGAT GCCGCATAGT
4921 TAAGCCAGCC CCGACACCCG CCAACACCCG CTGACGCGCC CTGACGGGCT TGTCTGCTCC
4981 CGGCATCCGC TTACAGACAA GCTGTGACCG TCTCCGGGAG CTGCATGTGT CAGAGGTTTT
5041 CACCGTCATC ACCGAAACGC GCGAGACGAA AGGGCCTCGT GATACGCCTA TTTTATAGG
5101 TTAATGTCAT GATAATAATG GTTTCTTAGA CGTCAGGTGG CACTTTTTCG GGAAATGTGC
5161 GCGGAACCCC TATTTGTTTA TTTTCTAAA TACATTCAAA TATGTATCCG CTCATGAGAC
5221 AATAACCCTG ATAAATGCTT CAATAATATT GAAAAAGGAA GAGTATGAGT ATTCAACATT
5281 TCCGTGTGCG CCTTATTCCC TTTTGTGCGG CATTTTGCCT TCCTGTTTTT GCTCACCCAG
5341 AAACGCTGGT GAAAGTAAAA GATGCTGAAG ATCAGTTGGG TGCACGAGTG GGTACATCG
5401 AACTGGATCT CAACAGCGGT AAGATCCTTG AGAGTTTTTC CCCCAGAGAA CGTTTTCCAA
5461 TGATGAGCAC TTTTAAAGTT CTGCTATGTG GCGCGGTATT ATCCCGTATT GACGCCGGGC
5521 AAGAGCAACT CGGTCGCCGC ATACACTATT CTCAGAATGA CTTGGTTGAG TACTCACCAG
5581 TCACAGAAAA GCATCTTACG GATGGCATGA CAGTAAGAGA ATTATGCAGT GCTGCCATAA
5641 CCATGAGTGA TAACACTGCG GCCAACTTAC TTCTGACAAC GATCGGAGGA CCGAAGGAGC
5701 TAACCGCTTT TTTGCACAAC ATGGGGGATC ATGTAAGTCG CCTTGATCGT TGGGAACCGG
5761 AGCTGAATGA AGCCATACCA AACGACGAGC GTGACACCAC GATGCCTGTA GCAATGGCAA -

FIGURE 46C

5821 CAACGTTGCG CAAACTATTA ACTGGCGAAC TACTTACTCT AGCTTCCCGG CAACAATTAA
 5881 TAGACTGGAT GGAGGCGGAT AAAGTTGCAG GACCATTCT GCGCTCGGCC CTTCCGGCTG
 5941 GCTGGTTTAT TGCTGATAAA TCTGGAGCCG GTGAGCGTGG GTCTCGCGGT ATCATTGCAG
 6001 CACTGGGGCC AGATGGTAAG CCCTCCCGTA TCGTAGTTAT CTACACGACG GGGAGTCAGG
 6061 CAACTATGGA TGAACGAAAT AGACAGATCG CTGAGATAGG TGCCTCACTG ATTAAGCATT
 6121 GGTAAC TGTC AGACCAAGTT TACTCATATA TACTTTAGAT TGATTTAAAA CTTCAATTTT
 6181 AATTTAAAAG GATCTAGGTG AAGATCCTTT TTGATAATCT CATGACCAAA ATCCCTTAAC
 6241 GTGAGTTTTT GTTCCACTGA GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG
 6301 ATCCTTTTTT TCTGCGCGTA ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG
 6361 TGGTTTGT TT GCCGGATCAA GAGCTACCAA CTCTTTTCC GAAGGTA ACT GGCTTCAGCA
 6421 GAGCGCAGAT ACCAAATACT GTCCTTCTAG TGTAGCCGTA GTTAGGCCAC CACTTCAAGA
 6481 ACTCTGTAGC ACCGCCTACA TACCTCGCTC TGCTAATCCT GTTACCAGTG GCTGCTGCCA
 6541 GTGGCGATAA GTCGTGTCTT ACCGGGTTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC
 6601 AGCGGTCGGG CTGAACGGGG GGTTCGTGCA CACAGCCCAG CTTGGAGCGA ACGACCTACA
 6661 CCGAACTGAG ATACCTACAG CGTGAGCATT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA
 6721 AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC
 6781 CAGGGGGAAA CGCCTGGTAT CTTTATAGTC CTGTGCGGTT TCGCCACCTC TGACTTGAGC
 6841 GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG
 6901 CCTTTTTACG GTTCCTGGCC TTTTGCTGGC CTTTGTGCTCA CATGTTCTTT CCTGCGTTAT
 6961 CCCCTGATTC TGTGGATAAC CGTATTACCG CCTTTGAGTG AGCTGATACC GCTCGCCGCA
 7021 GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGAGCGC CCAATACGCA
 7081 AACC GCCTCT CCCC GCGCGT TGGCCGATTC ATTAATGCAG AGCTTGCAAT TCGCGCGTTT
 7141 TTCAATATTA TTGAAGCATT TATCAGGGTT ATTGTCTCAT GAGCGGATAC ATATTTGAAT
 7201 GTATTTAGAA AAATAAACAA ATAGGGGTTT CGCGCACATT TCCCCGAAAA GTGCCACCTG
 7261 ACGTCTAAGA AACCATTATT ATCATGACAT TAACCTATAA AAATAGGCGT AGTACGAGGC
 7321 CCTTTCACTC ATTAGATGCA TGTCGTTACA TAACTTACGG TAAATGGCCC GCCTGGCTGA
 7381 CCGCCCAACG ACCCCCGCCC ATTGACGTCA ATAATGACGT ATGTTCCCAT AGTAACGCCA
 7441 ATAGGGACTT TCCATTGACG TCAATGGGTG GAGTATTTAC G

FIGURE 46D

Figure 47A

pDEST 27 GST Amino Fusion in pCMV Sport-neo Vector

CMV Promoter

600 // nac ggt ggg agg tct ata taa gca gag ctc gtt tag tga acc gtc aga tgg
 // ntg cca ccc tcc aga tat att cgt ctc gag caa atc act tgg cag tct agc

651 cct gga gac gcc atc cac gct gtt ttg acc tcc ata gaa gac acc ggg acc
 gga cct ctg cgg tag gtg cga caa aac tgg agg tat ctt ctg tgg ccc tgg

702 gat cca gcc tcc gga ctc tag cct agg cgg cgg acc atg gcc cct ata cta
 cta ggt cgg agg cct gag atc gga tcc ggc gcc tgg tac cgg gga tat gat
 Start Transin GST

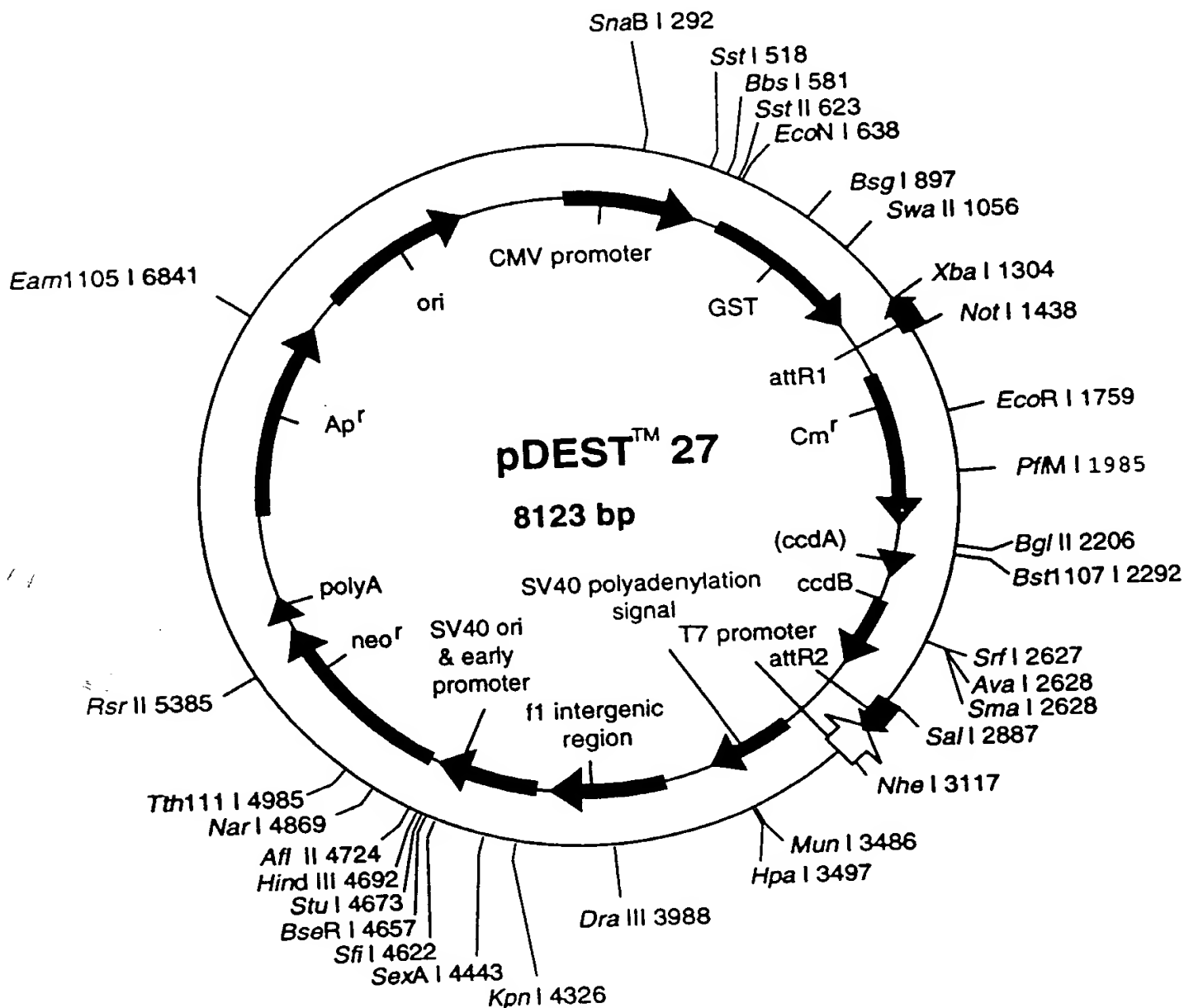
753 ggt tat tgg aaa att aag ggc ctt gtg caa ccc act cga ctt ctt ttg gaa
 cca ata acc ttt taa ttc ccg gaa cac gtt ggg tga gct gaa gaa aac ctt

804 tat ctt gaa gaa aaa tat gaa gag cat ttg tat gag cgc gat gaa ggt gat
 ata gaa ctt ctt ttt ata ctt ctc gta aac ata ctc gcg cta ctt cca cta

1365 // ttt ggt ggt ggc gac cat cct cca aaa tgg gat ctg gtt ccg cgt tct aga
 // aaa cca cca ccg ctg gta gga ggt ttt agc cta gac caa ggc gca aga tct

1416 tca aca agt ttg tac aaa aaa gct gaa cga gaa acg
 agt tgt tca aac atg ttt ttt cga ctt gct ctt tgc

Int attR1



pDEST27 8123 bp (rotated to position 7800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
130..793	GST
803..927	attR1
1036..1695	CmR
1815..1899	inactivated ccdA
2037..2342	ccdB
2383..2507	attR2
2693..3055	SV40 polyA
3250..3705	f1 intergenic region
3769..4187	SV40 promoter
4232..5026	neo
5090..5138	polyA
5549..6409	Apr
6558..7197	ori
7628..27	CMV promoter

1 ATAAGCAGAG CTCGTTTAGT GAACCGTCAG ATCGCCTGGA GACGCCATCC ACGCTGTTTT
 61 GACCTCCATA GAAGACACCG GGACCGATCC AGCCTCCGGA CTCTAGCCTA GGCCGCGGAC
 121 CATGGCCCCCT ATACTAGGTT ATTGGAAAAT TAAGGGCCTT GTGCAACCCA CTCGACTTCT
 181 TTTGGAATAT CTTGAAGAAA AATATGAAGA GCATTTGTAT GAGCGCGATG AAGGTGATAA
 241 ATGGCGAAAC AAAAAGTTTG AATTGGGTTT GGAGTTTCCC AATCTTCCTT ATTATATTGA
 301 TGGTGATGTT AAATTAACAC AGTCTATGGC CATCATACTG TATATAGCTG ACAAGCACAA
 361 CATGTTGGGT GGTGTGCCAA AAGAGCGTGC AGAGATTTCA ATGCTTGAAG GAGCGGTTTT
 421 GGATATTAGA TACGGTGTTT CGAGAATTGC ATATAGTAAA GACTTTGAAA CTCTCAAAGT
 481 TGATTTTCTT AGCAAGCTAC CTGAAATGCT GAAAATGTTC GAAGATCGTT TATGTCATAA
 541 AACATATTTA AATGGTGATC ATGTAACCCA TCCTGACTTC ATGTTGTATG ACGCTCTTGA
 601 TGTGTGTTTTA TACATGGACC CAATGTGCCT GGATGCGTTC CCAAAATTAG TTTGTTTTAA
 661 AAAACGTATT GAAGCTATCC CACAAATTGA TAAGTACTTG AAATCCAGCA AGTATATAGC
 721 ATGGCCTTTG CAGGGCTGGC AAGCCACGTT TGGTGGTGGC GACCATCCTC CAAAATCGGA
 781 TCTGGTTCCG CGTTCTAGAT CAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA
 841 TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG
 901 TAAAACACAA CATATCCAGT CACTATGGCG GCCGCATTAG GCACCCAGG CTTTACACTT
 961 TATGCTTCCG GCTCGTATAA TGTGTGGATT TTGAGTTAGG ATCCGGCGAG ATTTTCAGGA
 1021 GCTAAGGAAG CTAAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA TATATCCCAA
 1081 TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC CTATAACCAG
 1141 ACCGTTTCAGC TGGATATTAC GGCCTTTTTA AAGACCGTAA AGAAAAATAA GCACAAGTTT
 1201 TATCCGGCCT TTATTCACAT TCTTGCCCCG CTGATGAATG CTCATCCGGA ATTCCGTATG
 1261 GCAATGAAAG ACGGTGAGCT GGTGATATGG GATAGTGTTT ACCCTTGTTA CACCGTTTTT
 1321 CATGAGCAAA CTGAAACGTT TTCATCGCTC TGGAGTGAAT ACCACGACGA TTTCCGGCAG
 1381 TTTCTACACA TATATTCGCA AGATGTGGCG TGTTACGGTG AAAACCTGGC CTATTTCCCT
 1441 AAAGGGTTTA TTGAGAATAT GTTTTTTCGTC TCAGCCAATC CCTGGGTGAG TTTTACCAGT
 1501 TTTGATTTAA ACGTGGCCAA TATGGACAAC TTCTTCGCCC CCGTTTTTCAC CATGGGCAAA
 1561 TATTATACGC AAGGCGACAA GGTGCTGATG CCGCTGGCGA TTCAGGTTCA TCATGCCGTC
 1621 TGTGATGGCT TCCATGTCGG CAGAAATGCTT AATGAATTAC AACAGTACTG CGATGAGTGG
 1681 CAGGGCGGGG CGTAAAGATC TGGATCCGGC TTAATAAAG CCAGATAACA GTATGCGTAT
 1741 TTGCGCGCTG ATTTTTCGCG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA
 1801 AAAAGAGGTG TGCTATGAAG CAGCGTATTA CAGTGACAGT TGACAGCGAC AGCTATCAGT
 1861 TGCTCAAGGC ATATATGATG TCAATATCTC CGGTCTGGTA AGCACAACCA TGCAGAATGA
 1921 AGCCCGTCGT CTGCGTGCCG AACGCTGGAA AGCGGAAAAT CAGGAAGGGA TGGCTGAGGT
 1981 CGCCCGGTTT ATTGAAATGA ACGGCTCTTT TGCTGACGAG AACAGGGACT GGTGAAATGC
 2041 AGTTTAAGGT TTACACCTAT AAAAGAGAGA GCCGTTATCG TCTGTTTGTG GATGTACAGA
 2101 GTGATATTAT TGACACGCCC GGGCGACGGA TGGTGATCCC CCTGGCCAGT GCACGTCTGC
 2161 TGTCAGATAA AGTCTCCCGT GAACTTTACC CGGTGGTGCA TATCGGGGAT GAAAGCTGGC
 2221 GCATGATGAC CACCGATATG GCCAGTGTGC CGGTCTCCGT TATCGGGGAA GAAGTGGCTG
 2281 ATCTCAGCCA CCGCGAAAAT GACATCAAAA ACGCCATTAA CCTGATGTTC TGGGGAATAT —

FIGURE 47B

AAATGTCAGG CTCCCTTATA CACAGCCAGT CTGCAGGTCG ACCATAGTGA CTGGATATGT
TGTGTTTTAC AGTATTATGT AGTCTGTTTT TTATGCAAAA TCTAATTTAA TATATTGATA
TTTATATCAT TTTACGTTTC TCGTTCAGCT TTCTTGACAA AAGTGGTTGA TCGCGTGCAT
GCGACGTCAT AGCTCTCTCC CTATAGTGAG TCGTATTATA AGCTAGGCAC TGGCCGTCGT
TTTACAACGT CGTGACTGGG AAAACTGCTA GCTTGGGATC TTTGTGAAGG AACCTTACTT
CTGTGGTGTG ACATAATTGG ACAAACCTACC TACAGAGATT TAAAGCTCTA AGGTAAATAT
AAAATTTTTA AGTGTATAAT GTGTTAAACT AGCTGCATAT GCTTGCTGCT TGAGAGTTTT
GCTTACTGAG TATGATTTAT GAAAATATTA TACACAGGAG CTAGTGATTC TAATTGTTTG
TGTATTTTAG ATTCACAGTC CCAAGGCTCA TTTCAGGCCC CTCAGTCCTC ACAGTCTGTT
CATGATCATA ATCAGCCATA CCACATTTGT AGAGGTTTTA CTTGCTTTAA AAAACCTCCC
ACACCTCCCC CTGAACCTGA AACATAAAAT GAATGCAATT GTTGTGTGTA ACTTGTTTAT
TGCAGCTTAT AATGGTTACA AATAAAGCAA TAGCATCACA AATTTACAAA ATAAAGCATT
TTTTTCACTG CATTCTAGTT GTGGTTTGTG CAAACTCATC AATGTATCTT ATCATGTCTG
GATCGATCCT GCATTAATGA ATCGGCCAAC GCGCGGGGAG AGGCGGTTTG CGTATTGGCT
GGCGTAATAG CGAAGAGGCC CGCACCGATC GCCCTTCCCA ACAGTTGCGC AGCCTGAATG
GCGAATGGGA CGCGCCCTGT AGCGGCGCAT TAAGCGCGGC GGGTGTGGTG GTTACGCGCA
GCGTGACCGC TACACTTGCC AGCGCCCTAG CGCCCGCTCC TTTCGCTTTC TTCCCTTCCT
TTCTCGCCAC GTTCGCCGGC TTTCCCGGTC AAGCTCTAAA TCGGGGGCTC CCTTTAGGGT
TCCGATTTAG TGCTTTACGG CACCTCGACC CCAAAAAACT TGATTAGGGT GATGGTTCAC
GTAGTGGGCC ATCGCCCTGA TAGACGGTTT TTCGCCCTTT GACGTTGGAG TCCACGTTCT
TTAATAGTGG ACTCTTGTTT CAAACTGGAA CAACACTCAA CCCTATCTCG GTCTATTCTT
TTGATTTATA AGGGATTTTG CCGATTTTCGG CCTATTGGTT AAAAAATGAG CTGATTTAAC
AAATATTTAA CGCGAATTTT AACAAAATAT TAACGTTTAC AATTTTCGCT GATGCGGTAT
TTTCTCCTTA CGCATCTGTG CGGTATTTCA CACCGCATAC GCGGATCTGC GCAGACCAT
GGCCTGAAAT AACCTCTGAA AGAGGAACCT GGTAGGTAC CTTCTGAGGC GGAAAGAACC
AGCTGTGGAA TGTGTGTCAG TTAGGGTGTG GAAAGTCCCC AGGCTCCCCA GCAGGCAGAA
GTATGCAAAG CATGCATCTC AATTAGTCAG CAACCAGGTG TGGAAAGTCC CCAGGCTCCC
CAGCAGGCAG AAGTATGCAA AGCATGCATC TCAATTAGTC AGCAACCATA GTCCCGCCCC
TAACTCCGCC CATCCCGCCC CTAACCTCCG CCAGTTCCGC CCATTCTCCG CCCCATGGCT
GACTAATTTT TTTTATTTAT GCAGAGGCCG AGGCCGCCTC GGCCTCTGAG CTATTCCAGA
AGTAGTGAGG AGGCTTTTTT GGAGGCCTAG GCTTTTGCAA AAAGCTTGAT TCTTCTGACA
CAACAGTCTC GAACTTAAGG CTAGAGCCAC CATGATTGAA CAAGATGGAT TGCACGCAGG
TTCTCCGGCC GCTTGGGTGG AGAGGCTATT CGGCTATGAC TGGGCACAAC AGACAATCGG
CTGCTCTGAT GCCGCCGTGT TCCGGCTGTC AGCGCAGGGG CGCCCGGTTT TTTTGTCAA
GACCGACCTG TCCGGTGCCC TGAATGAACT GCAGGACGAG GCAGCGCGGC TATCGTGGCT
GGCCACGACG GCGGTTCTTT GCGCAGCTGT GCTCGACGTT GTCACCTGAG CGGGAAGGGA
CTGGCTGCTA TTGGGCGAAG TGCCGGGGCA GGATCTCCTG TCATCTCACC TTGCTCCTGC
CGAGAAAGTA TCCATCATGG CTGATGCAAT GCGGCGGCTG CATACGCTTG ATCCGGCTAC
CTGCCCATTG GACCACCAAG CGAAACATCG CATCGAGCGA GCACGTACTC GGATGGAAGC
CGGTCTTGTC GATCAGGATG ATCTGGACGA AGAGCATCAG GGGCTCGCGC CAGCCGAACT
GTTCCGCCAG CTCAAGGCGC GCATGCCCGA CGGCGAGGAT CTCGTCGTGA CCCATGGCGA
TGCCTGCTTG CCGAATATCA TGGTGGAAAA TGGCCGCTTT TCTGGATTCA TCGACTGTGG
CCGGCTGGGT GTGGCGGACC GCTATCAGGA CATAGCGTTG GCTACCCGTG ATATTGCTGA
AGAGCTTGCG GCGGAATGGG CTGACCGCTT CCTCGTGCTT TACGGTATCG CCGCTCCCGA
TTCGACGCGC ATCGCCTTCT ATCGCCTTCT TGACGAGTTC TTCTGAGCGG GACTCTGGGG
TTCGAAATGA CCGACCAAGC GACGCCAAC CTGCCATCAC GATGGCCGCA ATAAAATATC
TTTATTTTCA TTACATCTGT GTGTTGGTTT TTTGTGTGAA TCGATAGCGA TAAGGATCCG
CGTATGGTGC ACTCTCAGTA CAATCTGCTC TGATGCCGCA TAGTTAAGCC AGCCCCGACA
CCCGCCAACA CCCGCTGACG CGCCCTGACG GGCTTGTCTG CTCCCGGCAT CCGCTTACAG
ACAAGCTGTG ACCGTCTCCG GGAGCTGCAT GTGTCAGAGG TTTTCACCGT CATCACCAGG
ACGCGCGAGA CGAAAGGGCC TCGTGATACG CCTATTTTTA TAGGTTAATG TCATGATAAT
AATGGTTTCT TAGACGTCAG GTGGCACTTT TCGGGGAAAT GTGCGCGGAA CCCCTATTTG
TTTATTTTTT TAAATACATT CAAATATGTA TCCGCTCATG AGACAATAAC CCTGATAAAT
GCTTCAATAA TATTGAAAAA GGAAGAGTAT GAGTATTCAT CATTTCCTGT TCGCCCTTAT
TCCCTTTTTT GCGGCATTTT GCCTTCCTGT TTTTGCTCAC CCAGAAACGC TGGTGAAAGT
AAAAGATGCT GAAGATCAGT TGGGTGCACG AGTGGGTTAC ATCGAACTGG ATCTCAACAG
CGGTAAGATC CTTGAGAGTT TTCGCCCGA AGAACGTTTT CCAATGATGA GCACTTTTAA
AGTTCTGCTA TGTGGCGCGG TATTATCCCG TATTGACGCC GGGCAAGAGC AACTCGGTGCG -

FIGURE 47C

Figure 4B A: pEXP501: pCMV-SPORT 6 host for attB Libraries

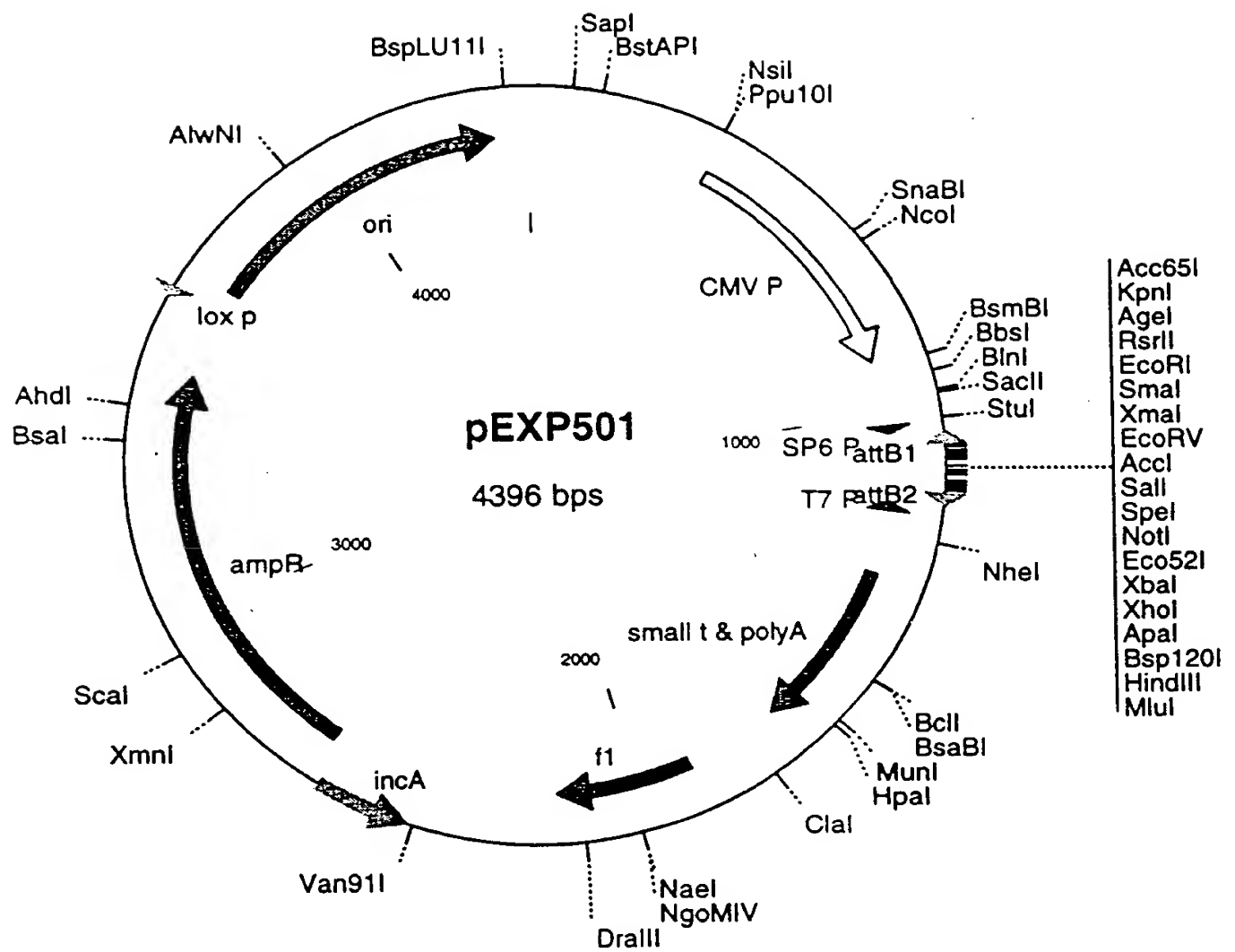


Figure 4BB:

pEXP501 (cont'd).
vector, pEXP501.
Bases within hatched area are
replaced by cDNA in some LTI cDNA libraries.

Features of the att B cloning
vector, pEXP501. Bases within hatched area are
replaced by cDNA in some LTI cDNA libraries.

868
---aga gct cgt tta gtg aac cgt cag atc gcc tgg aga cgc cat cca
---tct cga gca aat cac ttg gca gtc tag cgg acc tct gcg gta ggt

cgc tgt ttt gac ctc cat aga aga cac cgg gac cga tcc agc ctc
gcg aca aaa ctg gag gta tct tct gtg gcc ctg gct agg tct gag

Sst II LTI rev primer
cgg act cta gcc tag gcc ggc gag cgg ata aca att tca cac agg
gcc tga gat cgg atc cgg cgc ctc gcc tat tgt taa agt gtg tcc

ABE rev primer Sph SP6 promoter SP6
aaa cag cta tga cca tta ggc cta ttt agg tga cac tat aga aca
ttt gtc gat act ggt aat cgg gat aaa tcc act gtg ata tct tgt

Int attB1 Age Kpn Rsr II EcoRI Sma
agt ttg tac aaa aaa gca ggc tgg tac cgg tcc gga att ccc ggg
tca aac atg ttt ttt cgt cgg acc atg gcc agt cct taa ggg ccc

EcoRI Sal Spe Not Xba
ata/tcg tgg/adg agc tca/cta gtc ggc/ggc cgc tct aga gta tcc
tat/agc agc/tgc tgc agt gat cag cgc cgc ggc aga tct cat agg

Xba AclI HhaII Mlu attB2 Int
ctc gag ggg cct agc ctt acg cgt acc cag ctt tct tgt aca aag
gag ctc ccc ggg ttc gaa tgc gca tgg gtc gaa aga aca tct ttc

T7 T7 promoter ABE fwd
tgg tcc cta tag tga gtc gta tta taa gct agg cac tgg cgg tcc
acc agg gat atc act cag cat aat att cga tcc gtg acc ggc agc

Nhe 1272
ttt tac aac gtc gtg act ggg aaa act gct agc ttg gga tct ttg---
aaa atg ttg cag cac tga ccc ttt tga cga tgg aac cct aga aac---

LTI fwd

pEXP501 4396 bp

1 CCATTCGCCA TTCAGGCTGC GCAACTGTTG GGAAGGGCGA TCGGTGCGGG CCTCTTCGCT
61 ATTACGCCAG CCAATACGCA AACCGCCTCT CCCCgcgcgt TGGCCGATTC ATTAATGCAG
121 GATCGATCCA GACATGATAA GATACATTGA TGAGTTTGGG CAAACCACAA CTAGAATGCA
181 GTGAAAAAAA TGCTTTATTT GTGAAATTTG TGATGCTATT GCTTTATTTG TAACCATTAT
241 AAGCTGCAAT AAACAAGTTA ACAACAACAA TTGCATTCAT TTTATGTTTC AGGTTTCAGGG
301 GGAGGTGTGG GAGGTTTTTT AAAGCAAGTA AAACCTCTAC AAATGTGGTA TGGCTGATTA
361 TGATCATGAA CAGACTGTGA GGACTGAGGG GCCTGAAATG AGCCTTGGA CTGTGAATCT
421 AAAATACACA AACAATTAGA ATCACTAGCT CCTGTGTATA ATATTTTCAT AAATCATACT
481 CAGTAAGCAA AACTCTCAAG CAGCAAGCAT ATGCAGCTAG TTTAACACAT TATACACTTA
541 AAAATTTTAT ATTTACCTTA GAGCTTTAAA TCTCTGTAGG TAGTTTGTCC AATTATGTCA
601 CACCACAGAA GTAAGGTTC TTACAAAGA TCCCAAGCTA GCAGTTTTCC CAGTCACGAC
661 GTTGTAAGAC GACGGCCAGT GCCTAGCTTA TAATACGACT CACTATAGGG ACCACTTTGT
721 ACAAGAAAGC TGGGTACGCG TAAGCTTGGG CCCCTCGAGG GATCCTCTAG AGCGGCCGCC
781 GACTAGTGAG CTCGTCGACG ATATCCCGGG AATTCCGGAC CGGTACCAGC CTGCTTTTTT
841 GTACAAACTT GTTCTATAGT GTCACCTAAA TAGGCCTAAT GGTCATAGCT GTTTCCTGTG
901 TGAAATTGTT ATCCGCTCCG CGGCCTAGGC TAGAGTCCGG AGGCTGGATC GGTCCCGGTG
961 TCTTCTATGG AGGTCAAAAC AGCGTGGATG GCGTCTCCAG GCGATCTGAC GGTTCATAA
1021 ACGAGCTCTG CTTATATAGA CCTCCCACCG TACACGCCTA CCGCCCATTT GCGTCAATGG
1081 GCGGAGTTG TTACGACATT TTGGAAAGTC CCGTTGATTT TGGTGCCAAA ACAAACTCCC
1141 ATTGACGTCA ATGGGGTGGA GACTTGGAAA TCCCCGTGAG TCAAACCGCT ATCCACGCCC
1201 ATTGATGTAC TGCCAAAACC GCATCACCAT GGTAATAGCG ATGACTAATA CGTAGATGTA
1261 CTGCCAAGTA GGAAAGTCCC ATAAGGTCAT GTACTGGGCA TAATGCCAGG CGGGCCATTT
1321 ACCGTCATTG ACGTCAATAG GGGGCGTACT TGGCATATGA TACACTTGAT GTACTGCCAA
1381 GTGGGCAGTT TACCGTAAAT ACTCCACCCA TTGACGTCAA TGGAAAGTCC CTATTGGCGT
1441 TACTATGGGA ACATACGTCA TTATTGACGT CAATGGGCGG GGGTCGTTGG GCGGTCAGCC
1501 AGGCGGGCCA TTTACCGTAA GTTATGTAA GACATGCATC TAATGAGTGA AAGGGCCTCG
1561 TACTACGCCT ATTTTATAG GTTAATGTCA TGATAATAAT GGTTTCTTAG ACGTCAGGTG
1621 GCACTTTTCG GGGAAATGTG CGCGGAACCC CTATTTGTTT ATTTTCTAA ATACATTCAA
1681 ATATGTATCC GCTCATGAGA CAATAACCCT GATAAATGCT TCAATAATAT TGAAAAACGC
1741 GCGAATTGCA AGCTCTGCAT TAATGAATCG GCCAACGCGC GGGGAGAGGC GGTTCGCTA
1801 TTGGGCGCTC TTCCGCTTCC TCGCTCACTG ACTCGCTGCG CTCGGTCGTT CGGCTGCGGC
1861 GAGCGGTATC AGCTCACTCA AAGGCGGTAA TACGGTTATC CACAGAATCA GGGGATAACG
1921 CAGGAAAGAA CATGTGAGCA AAAGGCCAGC AAAAGGCCAG GAACCGTAAA AAGGCCGCGT
1981 TGCTGGCGTT TTTCCATAGG CTCCGCCCCC CTGACGAGCA TCACAAAAAT CGACGCTCAA
2041 GTCAGAGGTG GCGAAACCCG ACAGGACTAT AAAGATACCA GCGGTTTCCC CCTGGAAGCT
2101 CCCTCGTGCG CTCTCCTGTT CCGACCCTGC CGCTTACCGG ATACCTGTCC GCCTTTCTCC
2161 CTTCGGGAAG CGTGCGCCTT TCTCAATGCT CACGCTGTAG GTATCTCAGT TCGGTGTAGG
2221 TCGTTCGCTC CAAGCTGGGC TGTGTGCACG AACCCCCCGT TCAGCCCGAC CGCTGCGCCT
2281 TATCCGGTAA CTATCGTCTT GAGTCCAACC CGGTAAGACA CGACTTATCG CCACTGGCAG
2341 CAGCCACTGG TAACAGGATT AGCAGAGCGA GGTATGTAGG CGGTGCTACA GAGTCTTGA
2401 AGTGGTGGCC TAACACGGC TACACTAGAA GGACAGTATT TGGTATCTGC GCTCTGCTGA
2461 AGCCAGTTAC CTTGCGGAAA AGAGTTGGTA GCTCTTGATC CGGCAAACAA ACCACCGCTG
2521 GTAGCGGTGG TTTTTTTGTT TGCAAGCAGC AGATTACGCG CAGAAAAAAA GGATCTCAAG
2581 AAGATCCTTT GATCTTTTCT ACGGGGTCTG ACGCTCAGTG GAACGAAAAC TCACGTTAAG
2641 GGATTTTGGT CATGCCATAA CTTCGTATAG CATAATTAT ACGAAGTTAT GGCATGAGAT
2701 TATCAAAAAG GATCTTCACC TAGATCCTTT TAAATTAAAA ATGAAGTTT AAATCAATCT
2761 AAAGTATATA TGAGTAAACT TGGTCTGACA GTTACCAATG CTTAATCAGT GAGGCACCTA
2821 TCTCAGCGAT CTGTCTATTT CGTTCATCCA TAGTTGCCTG ACTCCCCGTC GTGTAGATAA
2881 CTACGATACG GGAGGGCTTA CCATCTGGCC CCAGTGCTGC AATGATACCG CGAGACCCAC
2941 GCTCACCGGC TCCAGATTTA TCAGCAATAA ACCAGCCAGC CGGAAGGGCC GAGCGCAGAA
3001 GTGGTCCTGC AACTTTATCC GCCTCCATCC AGTCTATTAA TTGTTGCCGG GAAGCTAGAG
3061 TAAGTAGTTC GCCAGTTAAT AGTTTGCGCA ACGTTGTTGC CATTGCTACA GGCATCGTGG
3121 TGTCACGCTC GTCGTTTGGT ATGGCTTCAT TCAGCTCCGG TTCCAACGA TCAAGGCGAG-

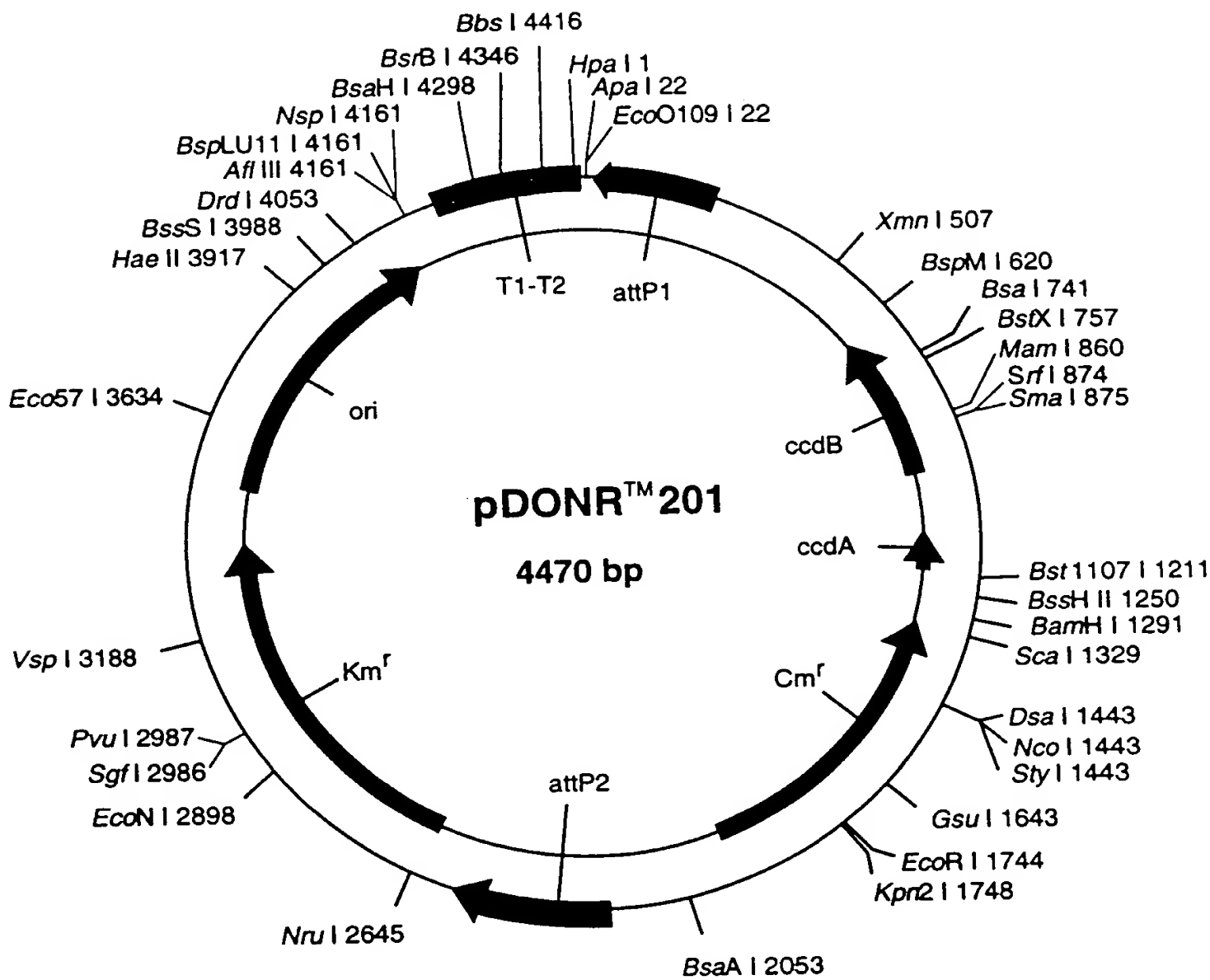
FIGURE 48C

3181 TTACATGATC CCCCATGTTG TGCAAAAAAG CGGTTAGCTC CTTCGGTCCT CCGATCGTTG
 3241 TCAGAAGTAA GTTGGCCGCA GTGTTATCAC TCATGGTTAT GGCAGCACTG CATAATTCTC
 3301 TTACTGTCAT GCCATCCGTA AGATGCTTTT CTGTGACTGG TGAGTACTCA ACCAAGTCAT
 3361 TCTGAGAATA GTGTATGCGG CGACCGAGTT GCTCTTGCCC GCGTCAATA CGGGATAATA
 3421 CCGCGCCACA TAGCAGAACT TTAAAAGTGC TCATCATTGG AAAACGTTCT TCGGGGCGAA
 3481 AACTCTCAAG GATCTTACCG CTGTTGAGAT CCAGTTCGAT GTAACCCACT CGTGCACCCA
 3541 ACTGATCTTC AGCATCTTTT ACTTTCACCA GCGTTTCTGG GTGAGCAAAA ACAGGAAGGC
 3601 AAAATGCCGC AAAAAAGGGA ATAAGGGCGA CACGGAAATG TTGAATACTC ATACTCTTCC
 3661 TTTTTCATAA TTATTGAAGC ATTTATCAGG GTTATTGTCT CATGCCAGGG GTGGGCACAC
 3721 ATATTTGATA CCAGCGATCC CTACACAGCA CATAATTCAA TCGCACTTCC CTCTATCGCA
 3781 CATCTTAGAC CTTTATTCTC CCTCCAGCAC ACATCGAAGC TGCCGAGCAA GCCGTTCTCA
 3841 CCAGTCCAAG ACCTGGCATG AGCGGATACA TATTTGAATG TATTTAGAAA AATAAACAAA
 3901 TAGGGGTTCC GCGCACATTT CCCCAGAAAAG TGCCACCTGA AATTGTAAAC GTTAATATTT
 3961 TGTTAAAATT CGCGTTAAAT TTTTGTAAA TCAGCTCATT TTTTAACCAA TAGGCCGAAA
 4021 TCGGCAAAAT CCCTTATAAA TCAAAGAAT AGACCGAGAT AGGGTTGAGT GTTGTTCCAG
 4081 TTTGGAACAA GAGTCCACTA TTAAAGAACG TGGACTCCAA CGTCAAAGGG CGAAAAACCG
 4141 TCTATCAGGG CGATGGCCCA CTACGTGAAC CATCACCTA ATCAAGTTTT TTGGGGTCGA
 4201 GGTGCCGTAA AGCACTAAAT CGGAACCCTA AAGGGAGCCC CCGATTTAGA GCTTGACGGG
 4261 GAAAGCCGGC GAACGTGGCG AGAAAGGAAG GGAAGAAAGC GAAAGGAGCG GCGCTAGGG
 4321 CGCTGGCAAG TGTAGCGGTC ACGCTGCGCG TAACCACCAC ACCCGCCGCG CTTAATGCGC
 4381 CGCTACAGGG CGCGTC

FIGURE 48D

Figure 49A

● ONR201 (kanR)



pDONR201 4470 bp (rotated to position 3516)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
260..29	attP1
656..961	ccdB
1099..1184	ccdA
1303..1962	CmR
2210..2442	attP2
2565..3374	Kmr
3495..4134	ori

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1  GTTAACGCTA GCATGGATCT CGGGCCCCAA ATAATGATTT TATTTTGGACT GATAGTGACC
61  TGTTCGTTGC AACAAATTGA TGAGCAATGC TTTTTTATAA TGCCAACTTT GTACAAAAAA
121 GCTGAACGAG AAACGTAAAA TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA
181 AAACAGACTA CATAATACTG TAAACACAA CATATCCAGT CACTATGAAT CAACTACTTA
241 GATGGTATTA GTGACCTGTA GTCGACCGAC AGCCTTCCAA ATGTTCTTCG GGTGATGCTG
301 CCAACTTAGT CGACCGACAG CCTTCCAAAT GTTCTTCTCA AACGGAATCG TCGTATCCAG
361 CCTACTCGCT ATTGTCCTCA ATGCCGTATT AAATCATAAA AAGAAATAAG AAAAAGAGGT
421 GCGAGCCTCT TTTTGTGTG ACAAATAAA AACATCTACC TATTCATATA CGCTAGTGTC
481 ATAGTCCTGA AAATCATCTG CATCAAGAAC AATTTACAA CTCTTATACT TTTCTCTTAC
541 AAGTCGTTTC GCTTCATCTG GATTTTCAGC CTCTATACTT ACTAAACGTG ATAAAGTTTC
601 TGTAATTTCT ACTGTATCGA CCTGCAGACT GGCTGTGTAT AAGGGAGCCT GACATTTATA
661 TTCCCAGAA CATCAGGTTA ATGGCGTTTT TGATGTCATT TTCGCGGTGG CTGAGATCAG
721 CCACTTCTTC CCCGATAACG GAGACCGGCA CACTGGCCAT ATCGGTGGTC ATCATGCGCC
781 AGCTTTCATC CCCGATATGC ACCACCGGGT AAAGTTCACG GGAGACTTTA TCTGACAGCA
841 GACGTGCACT GGCCAGGGGG ATCACCATCC GTCGCCCGGG CGTGTCAATA ATATCACTCT
901 GTACATCCAC AAACAGACGA TAACGGCTCT CTCTTTTATA GGTGTAAACC TTAAACTGCA
961 TTTCACCAGT CCCTGTTCTC GTCAGCAAAA GAGCCGTTCA TTTCAATAAA CCGGGCGACC
1021 TCAGCCATCC CTTCTGATT TTCCGCTTTC CAGCGTTCGG CACGCAGACG ACGGGCTTCA
1081 TTCTGCATGG TTGTGCTTAC CAGACCGGAG ATATTGACAT CATATATGCC TTGAGCAACT
1141 GATAGCTGTC GCTGTCAACT GTCACTGTAA TACGCTGCTT CATAGCACAC CTCTTTTGA
1201 CATACTTCGG GTATACATAT CAGTATATAT TCTTATACCG CAAAATCAG CGCGCAAATA
1261 CGCATACTGT TATCTGGCTT TTAGTAAGCC GGATCCACGC GATTACGCCC CGCCCTGCCA
1321 CTCATCGCAG TACTGTTGTA ATTCATTAAG CATTCTGCCG ACATGGAAGC CATCACAGAC
1381 GGCATGATGA ACCTGAATCG CCAGCGGCAT CAGCACCTTG TCGCCTTGCG TATAATATTT
1441 GCCCATGGTG AAAACGGGGG CGAAGAAGTT GTCCATATTG GCCACGTTTA AATCAAAACT
1501 GGTGAACTC ACCCAGGGAT TGGCTGAGAC GAAAAACATA TTCTCAATAA ACCCTTTAGG
1561 GAAATAGGCC AGGTTTTTCAC CGTAACACGC CACATCTTGC GAATATATGT GTAGAACTG
1621 CCGGAAATCG TCGTGGTATT CACTCCAGAG CGATGAAAAC GTTTCAGTTT GCTCATGGAA
1681 AACGGTGTA CAAGGGTGAA CACTATCCCA TATCACCAGC TCACCGTCTT TCATTGCCAT
1741 ACGGAATTCC GGATGAGCAT TCATCAGGCG GGCAAGAATG TGAATAAAGG CCGGATAAAA
1801 CTTGTGCTTA TTTTCTTTTA CGGTCTTTAA AAAGGCCGTA ATATCCAGCT GAACGGTCTG
1861 GTTATAGGTA CATTGAGCAA CTGACTGAAA TGCCTCAAAA TGTTCTTTAC GATGCCATTG
1921 GGATATATCA ACGGTGGTAT ATCCAGTGAT TTTTTTCTCC ATTTTAGCTT CCTTAGCTCC
1981 TGAAAATCTC GATAACTCAA AAAATACGCC CGGTAGTGAT CTTATTTTCAT TATGGTGAAA
2041 GTTGGAACCT CTTACGTGCC GATCAACGTC TCATTTTCGC CAAAAGTTGG CCCAGGGCTT
2101 CCCGGTATCA ACAGGGACAC CAGGATTTAT TTATTCTGCG AAGTGATCTT CCGTCACAGG
2161 TATTTATTTC GCGCAAAGTG CGTCGGGTGA TGCTGCCAAC TTAGTCGACT ACAGGTCCT
2221 AATACCATCT AAGTAGTTGA TTCATAGTGA CTGGATATGT TGTGTTTTAC AGTATTATGT
2281 AGTCTGTTTT TTATGCAAAA TCTAATTTAA TATATTGATA TTTATATCAT TTTACGTTTC
2341 TCGTTCAGCT TTCTTGTA CAAGTTGGCAT TATAAGAAAG CATTGCTTAT CAATTTGTTG
2401 CAACGAACAG GTCATATCA GTCAAAATAA AATCATTATT TGCCATCCAG CTGCAGCTCT
2461 GGCCCGTGTC TCAAAATCTC TGATGTTACA TTGCACAAGA TAAAAATATA TCATCATGAA
2521 CAATAAAACT GTCTGCTTAC ATAAACAGTA ATACAAGGGG TGTTATGAGC CATATTCAAC
2581 GGGAAACGTC GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTATAT GGGTATAAAT
2641 GGGCTCGCGA TAATGTCGGG CAATCAGGTG CGACAATCTA TCGCTTGAT GGGAGCCCG
2701 ATGCGCCAGA GTTGTTTCTG AAACATGGCA AAGGTAGCGT TGCCAATGAT GTTACAGATG ~

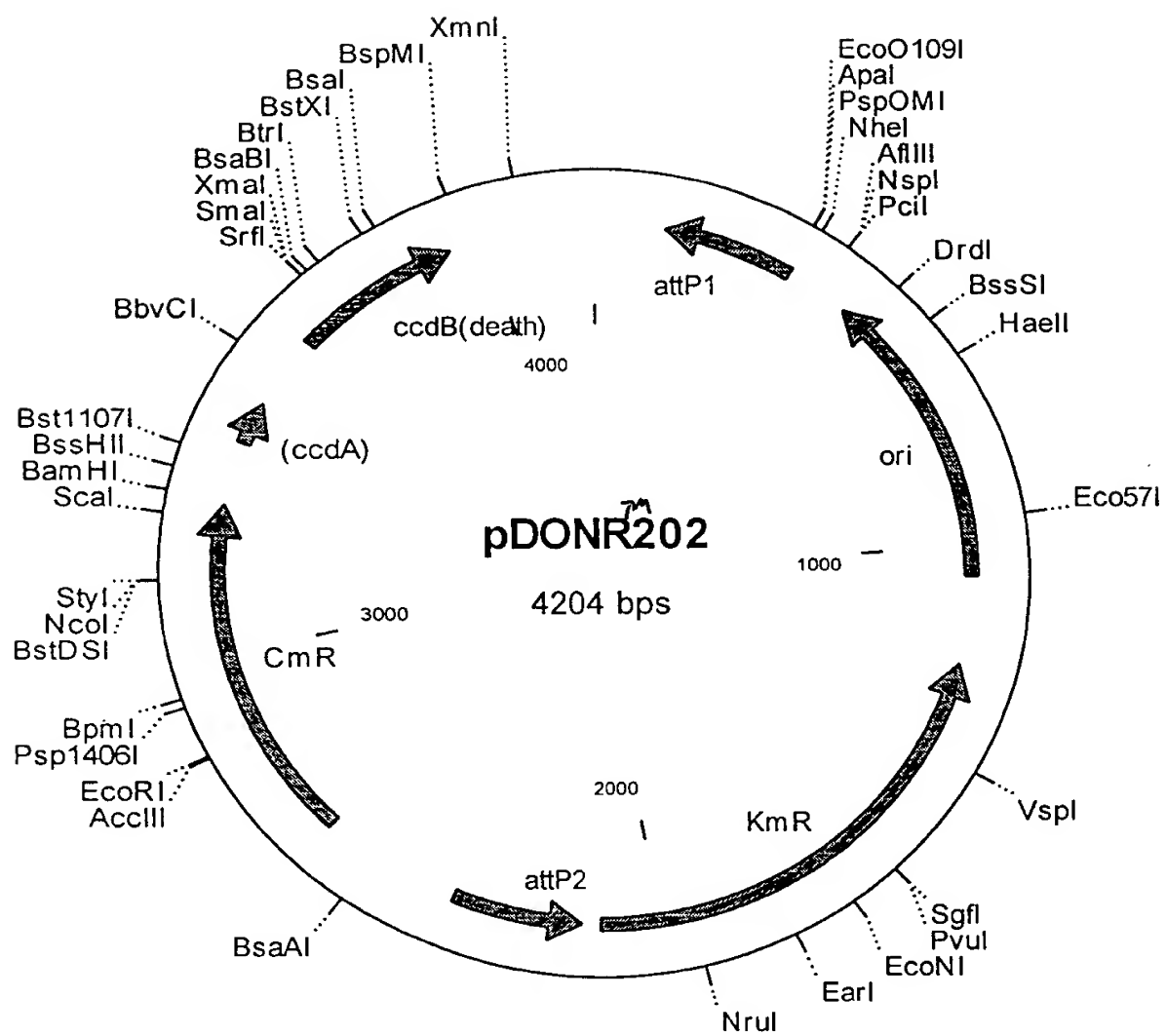
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FIGURE 49B

2761 AGATGGTCAG ACTAAACTGG CTGACGGAAT TTATGCCTCT TCCGACCATC AAGCATTTTA
 2821 TCCGTACTCC TGATGATGCA TGGTTACTCA CCACTGCGAT CCCC GGAAAA ACAGCATTC
 2881 AGGTATTAGA AGAATATCCT GATTCAGGTG AAAATATTGT TGATGCGCTG GCAGTGTTCC
 2941 TGCGCCGGTT GCATTTCGATT CCTGTTTGTA ATTGTCCTTT TAACAGCGAT CGCGTATTT
 3001 GTCTCGCTCA GGC GCAATCA CGAATGAATA ACGGTTTGGT TGATGCGAGT GATTTTGATG
 3061 ACGAGCGTAA TGGCTGGCCT GTTGAACAAG TCTGGAAAGA AATGCATAAA CTTT TGCCAT
 3121 TCTCACCGGA TTCAGTCGTC ACTCATGGTG ATTTCTCACT TGATAACCTT ATTTT TGACG
 3181 AGGGGAAATT AATAGGTTGT ATTGATGTTG GACGAGTCGG AATCGCAGAC CGATACCAGG
 3241 ATCTTGCCAT CCTATGGAAC TGCCTCGGTG AGTTTTCTCC TTCATTACAG AAACGGCTTT
 3301 TTCAAAAATA TGGTATTGAT AATCCTGATA TGAATAAATT GCAGTTTCAT TTGATGCTCG
 3361 ATGAGTTTTT CTAATCAGAA TTGGTTAATT GGTGTGAACA CTGGCAGAGC ATTACGCTGA
 3421 CTTGACGGGA CGGCGCAAGC TCATGACCAA AATCCCTTAA CGTGAGTTTT CGTTCCACTG
 3481 AGCGTCAGAC CCCGTAGAAA AGATCAAAGG ATCTTCTTGA GATCCTTTTT TTCTGCGCGT
 3541 AATCTGCTGC TTGCAAACAA AAAAACCACC GCTACCAGCG GTGGTTTGTT TGCCGGATCA
 3601 AGAGCTACCA ACTCTTTTTT CGAAGGTAAC TGGCTTCAGC AGAGCGCAGA TACCAAATAC
 3661 TGTCCTTCTA GTGTAGCCGT AGTTAGGCCA CCACTTCAAG AACTCTGTAG CACCGCCTAC
 3721 ATACCTCGCT CTGCTAATCC TGTTACCAGT GGCTGCTGCC AGTGGCGATA AGTCGTGTCT
 3781 TACCGGGTTG GACTCAAGAC GATAGTTACC GGATAAGGCG CAGCGGTCGG GCTGAACGGG
 3841 GGGTTCGTGC ACACAGCCCA GCTTGGAGCG AACGACCTAC ACCGAACTGA GATACCTACA
 3901 GCGTGAGCTA TGAGAAAGCG CCACGCTTCC CGAAGGGAGA AAGGCGGACA GGTATCCGGT
 3961 AAGCGGCAGG GTCGGAACAG GAGAGCGCAC GAGGGAGCTT CCAGGGGGAA ACGCCTGGTA
 4021 TCTTTATAGT CCTGTCGGGT TTCGCCACCT CTGACTTGAG CGTCGATTTT TGTGATGCTC
 4081 GTCAGGGGGG CGGAGCCTAT GGAAAAACGC CAGCAACGCG GCCTTTTTTAC GGTTCTGGC
 4141 CTTT TGCTGG CTTTTTGCTC ACATGTTCTT TCCTGCGTTA TCCCCTGATT CTGTGGATAA
 4201 CCGTATTACC GCTAGCCAGG AAGAGTTTGT AGAAACGCAA AAAGGCCATC CGTCAGGATG
 4261 GCCTTCTGCT TAGTTTGATG CCTGGCAGTT TATGGCGGGC GTCCTGCCCC CCACCCTCCG
 4321 GGCCGTTGCT TCACAACGTT CAAATCCGCT CCCGGCGGAT TTGTCCTACT CAGGAGAGCG
 4381 TTCACCGACA AACACAGAT AAAACGAAAG GCCCAGTCTT CCGACTGAGC CTTTCGTTTT
 4441 ATTTGATGCC TGGCAGTTCC CTACTCTCGC

FIGURE 49C

FIGURE 50A: pDONR202 (kan^R)



pDONR202 4204 bp

Location (Base Nos.)	Gene Encoded
369..127	attP1
486..1059	ori
1228..2107	KmR
2381..2140	attP2
2629..3288	CmR
3408..3492	inactivated ccdA
3630..3935	ccdB

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1 CGGCATTGAG GACAATAGCG AGTAGGCTGG ATACGACGAT TCCGTTTGAG AAGAACATTT
61 GGAAGGCTGT CGGTCGACTA AGTTGGCAGC ATCACCCGAA GAACATTTGG AAGGCTGTCTG
121 GTCGACTACA GGTCACCTAAT ACCATCTAAG TAGTTGATTC ATAGTGAAGT GATATGTTGT
181 GTTTTACAGT ATTATGTAGT CTGTTTTTTTA TGCAAAATCT AATTTAATAT ATTGATATTT
241 ATATCATTTT ACGTTTCTCG TTCAGCTTTT TTGTACAAAG TTGGCATTAT AAAAAAGCAT
301 TGCTCATCAA TTTGTTGCAA CGAACAGGTC ACTATCAGTC AAAATAAAAT CATTATTTGG
361 GGCCCGAGAT CCATGCTAGC GGTAATACGG TTATCCACAG AATCAGGGGA TAACGCAGGA
421 AAGAACATGT GAGCAAAAGG CCAGCAAAAG GCCAGGAACC GTAAAAAGGC CGCGTTGCTG
481 GCGTTTTTCC ATAGGCTCCG CCCCCCTGAC GAGCATCACA AAAATCGACG CTCAAGTCAG
541 AGGTGGCGAA ACCCGACAGG ACTATAAAGA TACCAGGCGT TTCCCCCTGG AAGCTCCCTC
601 GTGCGCTCTC CTGTTCCGAC CCTGCCGCTT ACCGGATACC TGTCCGCCTT TCTCCCTTCG
661 GGAAGCGTGG CGCTTTCTCA TAGCTCACGC TGTAGGTATC TCAGTTCGGT GTAGGTCGTT
721 CGCTCCAAGC TGGGCTGTGT GCACGAACCC CCCGTTTCAGC CCGACCGCTG CGCCTTATCC
781 GGTAACATATC GTCTTGAGTC CAACCCGGTA AGACACGACT TATCGCCACT GGCAGCAGCC
841 ACTGGTAACA GGATTAGCAG AGCGAGGTAT GTAGGCGGTG CTACAGAGTT CTTGAAGTGG
901 TGGCCTAACT ACGGCTACAC TAGAAGGACA GTATTTGGTA TCTGCGCTCT GCTGAAGCCA
961 GTTACCTTCG GAAAAAGAGT TGGTAGCTCT TGATCCGGCA ACAAACCAC CGCTGGTAGC
1021 GGTGGTTTTT TTGTTTGCAA GCAGCAGATT ACGCGCAGAA AAAAAGGATC TCAAGAAGAT
1081 CCTTTGATCT TTTCTACGGG GTCTGACGCT CAGTGGAACG AAAACTCACG TTAAGGGATT
1141 TTGGTCATGA GCTTGCGCCG TCCCGTCAAG TCAGCGTAAT GCTCTGCCAG TGTTACAACC
1201 AATTAACCAA TTCTGATTAG AAAAATCAT CGAGCATCAA ATGAAACTGC AATTTATTCA
1261 TATCAGGATT ATCAATACCA TATTTTTGAA AAAGCCGTTT CTGTAATGAA GGAGAAAAT
1321 CACCGAGGCA GTTCCATAGG ATGGCAAGAT CCTGGTATCG GTCTGCGATT CCGACTCGTC
1381 CAACATCAAT ACAACCTATT AATTTCCCCT CGTCAAAAAT AAGGTTATCA AGTGAGAAAT
1441 CACCATGAGT GACGACTGAA TCCGGTGAGA ATGGCAAAAG TTTATGCATT TCTTTCCAGA
1501 CTTGTTCAAC AGGCCAGCCA TTACGCTCGT CATCAAAATC ACTCGCATCA ACCAAACCGT
1561 TATTCATTCG TGATTGCGCC TGAGCGAGAC GAAATACGCG ATCGCTGTTA AAAGGACAAT
1621 TACAAACAGG AATCGAATGC AACC GGCGCA GGAACACTGC CAGCGCATCA ACAATATTTT
1681 CACCTGAATC AGGATATTCT TCTAATACCT GGAATGCTGT TTTTCCGGGG ATCGCAGTGG
1741 TGAGTAACCA TGCATCATCA GGAGTACGGA TAAATGCTT GATGGTCGGA AGAGGCATAA
1801 ATTCCGTCAG CCAGTTTAGT CTGACCATCT CATCTGTAAC ATCATTGGCA ACGCTACCTT
1861 TGCCATGTTT CAGAAACAAC TCTGGCGCAT CGGGCTTCCC ATACAAGCGA TAGATTGTCTG
1921 CACCTGATTG CCCGACATTA TCGCGAGCCC ATTTATACCC ATATAAATCA GCATCCATGT
1981 TGGAATTTAA TCGCGGCCTC GACGTTTCCC GTTGAATATG GCTCATAACA CCCCTTGTAT
2041 TACTGTTTAT GTAAGCAGAC AGTTTTATTG TTCATGATGA TATATTTTTA TCTTGTGCAA
2101 TGTAACATCA GAGATTTTGA GACACGGGCC AGAGCTGCAG CTGGATGGCA AATAATGATT
2161 TTATTTTGAC TGATAGTGAC CTGTTTCGTT CAACAAATG ATAAGCAATG CTTTCTTATA
2221 ATGCCAACTT TGTACAAGAA AGCTGAACGA GAAACGTAAA ATGATATAAA TATCAATATA
2281 TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAAACACA ACATATCCAG
2341 TCACTATGAA TCAACTACTT AGATGGTATT AGTGACCTGT AGTCGACTAA GTTGGCAGCA
2401 TCACCCGACG CACTTTGCGC CGAATAAATA CCTGTGACGG AAGATCACTT CGCAGAATAA
2461 ATAAATCCTG GTGTCCCTGT TGATACCGGG AAGCCCTGGG CCAACTTTTG GCGAAAATGA
2521 GACGTTGATC GGCACGTAAG AGGTTCCAAC TTTCACCATA ATGAAATAAG ATCACTACCG
2581 GCGGTATTTT TTGAGTTATC GAGATTTTCA GGAGCTAAGG AAGCTAAAAT GGAGAAAAAA
2641 ATCACTGGAT ATACCACCGT TGATATATCC CAATGGCATC GTAAAGAACA TTTTGAGGCA
2701 TTTCAGTCAG TTGCTCAATG TACCTATAAC CAGACCGTTC AGCTGGATAT TACGGCCTTT

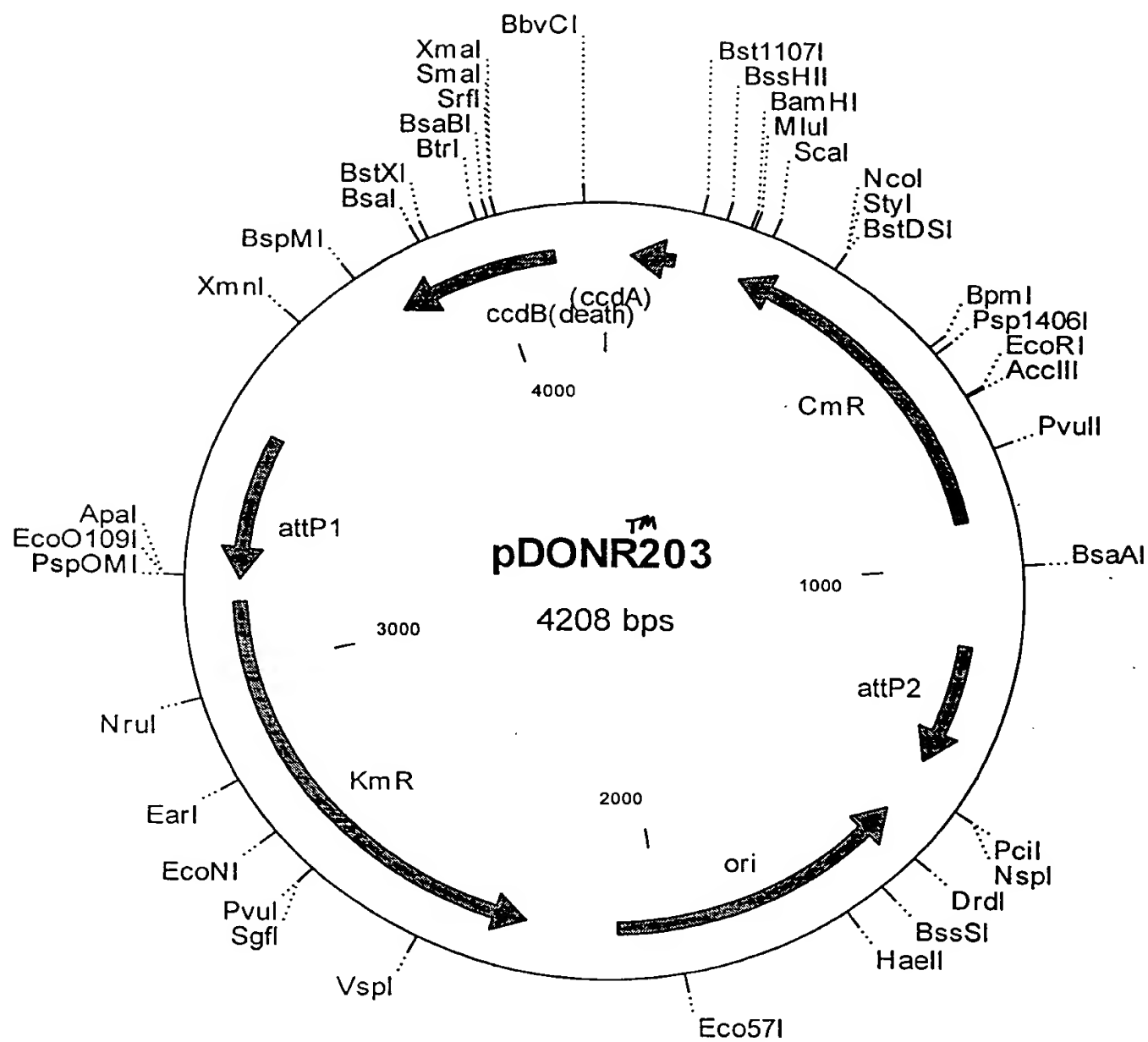
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Figure 50B

2761 TTAAAGACCG TAAAGAAAAA TAAGCACAAG TTTTATCCGG CCTTTATTCA CATTCTTGCC
 2821 CGCCTGATGA ATGCTCATCC GGAATTCCGT ATGGCAATGA AAGACGGTGA GCTGGTGATA
 2881 TGGGATAGTG TTCACCCTTG TTACACCGTT TTCCATGAGC AAAGTGAAC GTTTTCATCG
 2941 CTCTGGAGTG AATACCACGA CGATTTCCGG CAGTTTCTAC ACATATATTC GCAAGATGTG
 3001 GCGTGTTACG GTGAAAACCT GGCCTATTTT CCTAAAGGGT TTATTGAGAA TATGTTTTTC
 3061 GTCTCAGCCA ATCCCTGGGT GAGTTTCACC AGTTTTGATT TAAACGTGGC CAATATGGAC
 3121 AACTTCTTCG CCCCCGTTTT CACCATGGGC AAATATTATA CGCAAGGCGA CAAGGTGCTG
 3181 ATGCCGCTGG CGATTCAGGT TCATCATGCC GTCTGTGATG GCTTCCATGT CGGCAGAATG
 3241 CTTAATGAAT TACAACAGTA CTGCGATGAG TGGCAGGGCG GGGCGTAATC GCGTGATCC
 3301 GGCTTACTAA AAGCCAGATA ACAGTATGCG TATTTGCGCG CTGATTTTTG CGGTATAAGA
 3361 ATATATACTG ATATGTATAC CCGAAGTATG TCAAAAAGAG GTGTGCTATG AAGCAGCGTA
 3421 TTACAGTGAC AGTTGACAGC GACAGCTATC AGTTGCTCAA GGCATATATG ATGTCAATAT
 3481 CTCCGGTCTG GTAAGCACAA CCATGCAGAA TGAAGCCCGT CGTCTGCGTG CCGAACGCTG
 3541 GAAAGCGGAA AATCAGGAAG GGATGGCTGA GGTCGCCCCG TTTATTGAAA TGAACGGCTC
 3601 TTTTGCTGAC GAGAACAGGG ACTGGTGAAA TGCAGTTTAA GGTTTACACC TATAAAGAG
 3661 AGAGCCGTTA TCGTCTGTTT GTGGATGTAC AGAGTGATAT TATTGACACG CCCGGGCGAC
 3721 GGATGGTGAT CCCCCTGGCC AGTGCACGTC TGCTGTCAGA TAAAGTCTCC CGTGAACTTT
 3781 ACCCGGTGGT GCATATCGGG GATGAAAGCT GGCGCATGAT GACCACCGAT ATGGCCAGTG
 3841 TGCCGGTCTC CGTTATCGGG GAAGAAGTGG CTGATCTCAG CCACCGCGAA AATGACATCA
 3901 AAAACGCCAT TAACCTGATG TTCTGGGGAA TATAAATGTC AGGCTCCCTT ATACACAGCC
 3961 AGTCTGCAGG TCGATACAGT AGAAATTACA GAAACTTTAT CACGTTTAGT AAGTATAGAG
 4021 GCTGAAAATC CAGATGAAGC CGAACGACTT GTAAGAGAAA AGTATAAGAG TTGTGAAATT
 4081 GTTCTTGATG CAGATGATTT TCAGGACTAT GACACTAGCG TATATGAATA GGTAGATGTT
 4141 TTTATTTTGT CACACAAAAA AGAGGCTCGC ACCTCTTTTT CTTATTTCTT TTTATGATTT
 4201 AATA

FIGURE 50C

FIGURE 511 pDONR203 (kanR)



pDONR203 4208 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
47..131	inactivated ccdA
251..910	CmR
1158..1398	attP2
1509..2082	ori
2251..3130	KmR
3464..3174	attP1
3812..4117	ccdB

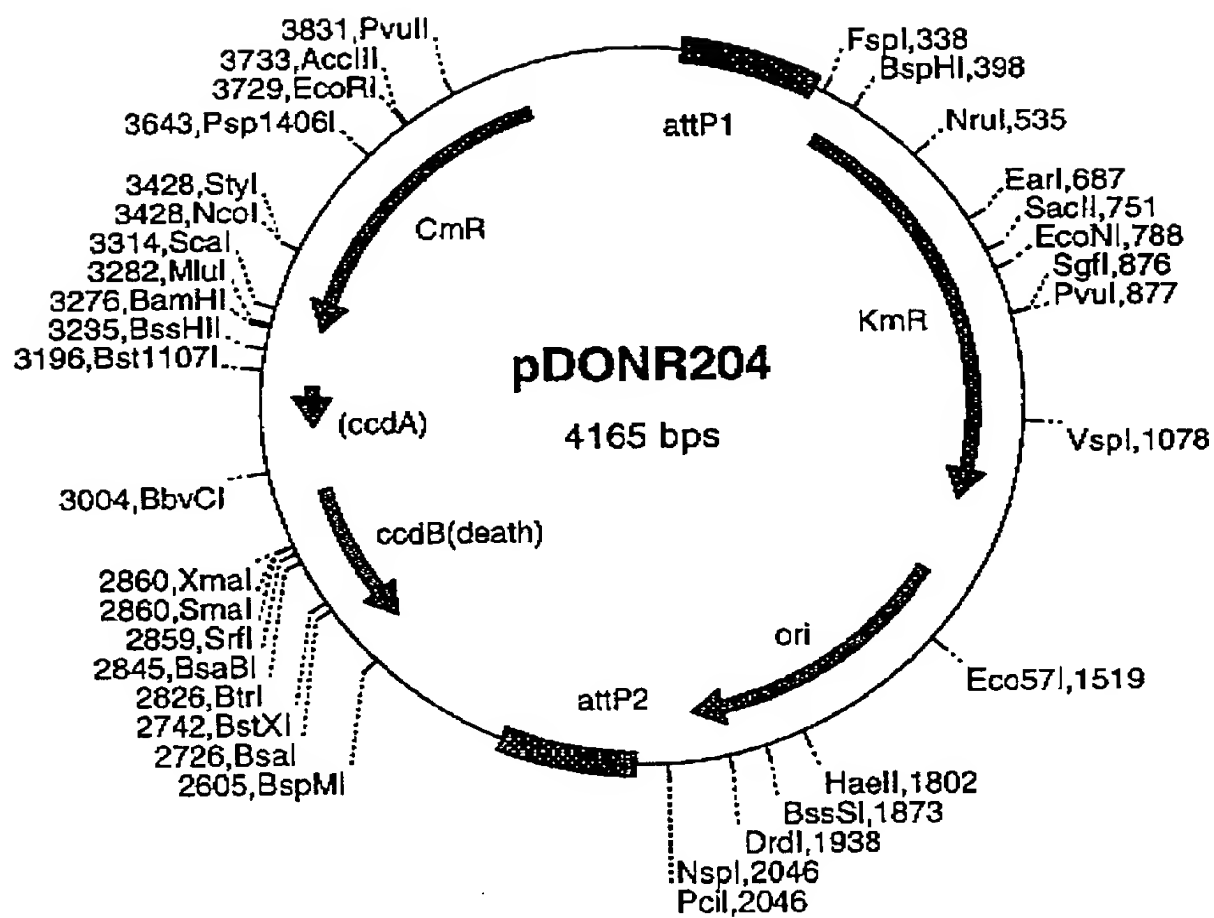
1 GCGTTCGGCA CGCAGACGAC GGGCTTCATT CTGCATGGTT GTGCTTACCA GACCGGAGAT
 61 ATTGACATCA TATATGCCTT GAGCAACTGA TAGCTGTGCG TGTCAACTGT CACTGTAATA
 121 CGCTGCTTCA TAGCACACCT CTTTTTGACA TACTTCGGGT ATACATATCA GTATATATTC
 181 TTATACCGCA AAAATCAGCG CGCAAATACG CATACTGTGA TCTGGCTTTT AGTAAGCCGG
 241 ATCCACGCGT TTACGCCCCG CCCTGCCACT CATCGCAGTA CTGTTGTAAT TCATTAAGCA
 301 TTCTGCCGAC ATGGAAGCCA TCACAGACGG CATGATGAAC CTGAATCGCC AGCGGCATCA
 361 GCACCTTGTC GCCTTGCGTA TAATATTTGC CCATGGTGAA AACGGGGGCG AAGAAGTTGT
 421 CCATATTGGC CACGTTTAAA TCAAACTGG TGAAACTCAC CCAGGGATTG GCTGAGACGA
 481 AAAACATATT CTCAATAAAC CCTTTAGGGA AATAGGCCAG GTTTTCACCG TAACACGCCA
 541 CATCTTGCGA ATATATGTGT AGAACTGCC GGAAATCGTC GTGGTATTCA CTCCAGAGCG
 601 ATGAAAACGT TTCAGTTTGC TCATGGAAAA CGGTGTAACA AGGGTGAACA CTATCCATA
 661 TCACCAGCTC ACCGTCTTTC ATTGCCATAC GGAATTCCGG ATGAGCATTG ATCAGGCGGG
 721 CAAGAATGTG AATAAAGGCC GGATAAACT TGTGCTTATT TTTCTTTACG GTCTTTAAAA
 781 AGGCCGTAAT ATCCAGCTGA ACGGTCTGGT TATAGGTACA TTGAGCAACT GACTGAAATG
 841 CCTCAAAATG TTCTTTACGA TGCCATTGGG ATATATCAAC GGTGGTATAT CCAGTGATTT
 901 TTTTCTCCAT TTTAGCTTCC TTAGCTCCTG AAAATCTCGA TAACTCAAAA AATACGCCCG
 961 GTAGTGATCT TATTTTATTA TGGTGAAAGT TGGAACCTCT TACGTGCCGA TCAACGTCTC
 1021 ATTTTCGCCA AAAGTTGGCC CAGGGCTTCC CGGTATCAAC AGGGACACCA GGATTTATTT
 1081 ATTCTGCGAA GTGATCTTCC GTCACAGGTA TTTATTCGGC GCAAAGTGCG TCGGGTGATG
 1141 CTGCCAACTT AGTCGACTAC AGGTCACATA TACCATCTAA GTAGTTGATT CATAGTACT
 1201 GGATATGTTG TGTTTTACAG TATTATGTAG TCTGTTTTTT ATGCAAAATC TAATTTAATA
 1261 TATTGATATT TATATCATTT TACGTTTCTC GTTCAGCTTT CTTGTACAAA GTTGGCATT
 1321 TAAGAAAGCA TTGCTTATCA ATTTGTTGCA ACGAACAGGT CACTATCAGT CAAAATAAAA
 1381 TCATTATTTG CCATCCAGCT AGCGGTAATA CGGTTATCCA CAGAATCAGG GGATAACGCA
 1441 GGAAAGAACA TGTGAGCAAA AGGCCAGCAA AAGGCCAGGA ACCGTAAAAA GGCCGCGTTG
 1501 CTGGCGTTTT TCCATAGGCT CCGCCCCCTT GACGAGCATC ACAAAAATCG ACGCTCAAGT
 1561 CAGAGGTGGC GAAACCCGAC AGGACTATAA AGATACCAGG CGTTTCCCCC TGGAAGCTCC
 1621 CTCGTGCGCT CTCCTGTTCC GACCCTGCCG CTTACCGGAT ACCTGTCCGC CTTTCTCCCT
 1681 TCGGGAAGCG TGGCGCTTTC TCATAGCTCA CGCTGTAGGT ATCTCAGTTC GGTGTAGGTC
 1741 GTTCGCTCCA AGCTGGGCTG TGTGCACGAA CCCCCGTTT AGCCCGACCG CTGCGCCTTA
 1801 TCCGGTAAC ATCGTCTTGA GTCCAACCCG GTAAGACACG ACTTATCGCC ACTGGCAGCA
 1861 GCCACTGGTA ACAGGATTAG CAGAGCGAGG TATGTAGGCG GTGCTACAGA GTTCTTGAAG
 1921 TGGTGGCCTA ACTACGGCTA CACTAGAAGA ACAGTATTTG GTATCTGCGC TCTGCTGAAG
 1981 CCAGTTACCT TCGGAAAAAG AGTTGGTAGC TCTTGATCCG GCAAACAAAC CACCGCTGGT
 2041 AGCGGTGGTT TTTTGTGTTG CAAGCAGCAG ATTACGCGCA GAAAAAAGG ATCTCAAGAA
 2101 GATCCTTTGA TCTTTTCTAC GGGGTCTGAC GCTCAGTGGA ACGAAAATC ACGTTAAGGG
 2161 ATTTTGGTCA TGAGCTTGCG CCGTCCCGTC AAGTCAGCGT AATGCTCTGC CAGTGTTACA
 2221 ACCAATTAAC CAATTCTGAT TAGAAAACT CATCGAGCAT CAAATGAAAC TGCAATTTAT
 2281 TCATATCAGG ATTATCAATA CCATATTTTT GAAAAAGCCG TTTCTGTAAT GAAGGAGAAA
 2341 ACTCACCGAG GCAGTTCCAT AGGATGGCAA GATCCTGGTA TCGGTCTGCG ATTCCGACTC
 2401 GTCCAACATC AATACAACCT ATTAATTTCC CCTCGTCAAA AATAAGGTTA TCAAGTGAGA
 2461 AATCACCATG AGTGACGACT GAATCCGGTG AGAATGGCAA AAGTTTATGC ATTTCTTTCC
 2521 AGACTTGTTT AACAGGCCAG CCATTACGCT CGTCATCAAA ATCACTCGCA TCAACCAAAC
 2581 CGTTATTCAT TCGTGATTGC GCCTGAGCGA GACGAAATAC GCGATCGCTG TTAAGAGGAC
 2641 AATTACAAAC AGGAATCGAA TGCAACCGGC GCAGGAACAC TGCCAGCGCA TCAACAATAT
 2701 TTTACCTGA ATCAGGATAT TCTTCTAATA CCTGGAATGC TGTTTTTCCG GGGATCGCAG-

FIGURE 51B

2761 TGGTGAGTAA CCATGCATCA TCAGGAGTAC GGATAAAATG CTTGATGGTC GGAAGAGGCA
 2821 TAAATTCCGT CAGCCAGTTT AGTCTGACCA TCTCATCTGT AACATCATTG GCAACGCTAC
 2881 CTTTGCCATG TTTCAGAAAC AACTCTGGCG CATCGGGCTT CCCATACAAG CGATAGATTG
 2941 TCGCACCTGA TTGCCCAGCA TTATCGCGAG CCCATTTATA CCCATATAAA TCAGCATCCA
 3001 TGTTGGAATT TAATCGCGGC CTCGACGTTT CCCGTTGAAT ATGGCTCATA ACACCCCTTG
 3061 TATTACTGTT TATGTAAGCA GACAGTTTTA TTGTTTCATGA TGATATATTT TTATCTTGTG
 3121 CAATGTAACA TCAGAGATTT TGAGACACGG GCCAGAGCTG CAGCTAGCAT GGATCTCGGG
 3181 CCCCAAATAA TGATTTTATT TTGACTGATA GTGACCTGTT CGTTGCAACA AATTGATGAG
 3241 CAATGCTTTT TTATAATGCC AACTTTGTAC AAAAAAGCTG AACGAGAAAC GTAAAATGAT
 3301 ATAAATATCA ATATATTAAA TTAGATTTTG CATAAAAAAC AGACTACATA ATACTGTAAA
 3361 ACACAACATA TCCAGTCACT ATGAATCAAC TACTTAGATG GTATTAGTGA CCTGTAGTCG
 3421 ACCGACAGCC TTCCAAATGT TCTTCGGGTG ATGCTGCCAA CTTAGTCGAC CGACAGCCTT
 3481 CCAATGTTC TTCTCAAACG GAATCGTCGT ATCCAGCCTA CTCGCTATTG TCCTCAATGC
 3541 CGTATTAAAT CATAAAAAGA AATAAGAAAA AGAGGTGCGA GCCTCTTTTT TGTGTGACAA
 3601 AATAAAAACA TCTACCTATT CATATACGCT AGTGTCTAG TCCTGAAAAT CATCTGCATC
 3661 AAGAACAATT TCACAACCTT TATACTTTTC TCTTACAAGT CGTTCGGCTT CATCTGGATT
 3721 TTCAGCCTCT ATACTTACTA AACGTGATAA AGTTTCTGTA ATTTCTACTG TATCGACCTG
 3781 CAGACTGGCT GTGTATAAGG GAGCCTGACA TTTATATTCC CCAGAACATC AGGTTAATGG
 3841 CGTTTTTGAT GTCATTTTCG CGGTGGCTGA GATCAGCCAC TTCTTCCCCG ATAACGGAGA
 3901 CCGGCACACT GGCCATATCG GTGGTCATCA TGCGCCAGCT TTCATCCCCG ATATGCACCA
 3961 CCGGGTAAAG TTCACGGGAG ACTTTATCTG ACAGCAGACG TGCACTGGCC AGGGGGATCA
 4021 CCATCCGTCG CCCGGGCGTG TCAATAATAT CACTCTGTAC ATCCACAAAC AGACGATAAC
 4081 GGCTCTCTCT TTTATAGGTG TAAACCTTAA ACTGCATTTC ACCAGTCCCT GTTCTCGTCA
 4141 GCAAAAGAGC CGTTCATTTT AATAAACCGG GCGACCTCAG CCATCCCTTC CTGATTTTCC
 4201 GCTTTCCA

FIGURE 51C

THE UNITED STATES OF AMERICA
DO hereby certify that
JAMES EARL RAY
is the author of the book
entitled "The Life of
James Earl Ray"
written by
JAMES EARL RAY
and published by
DAVID L. RAY
in 1968.



pDONR204 4165 bp

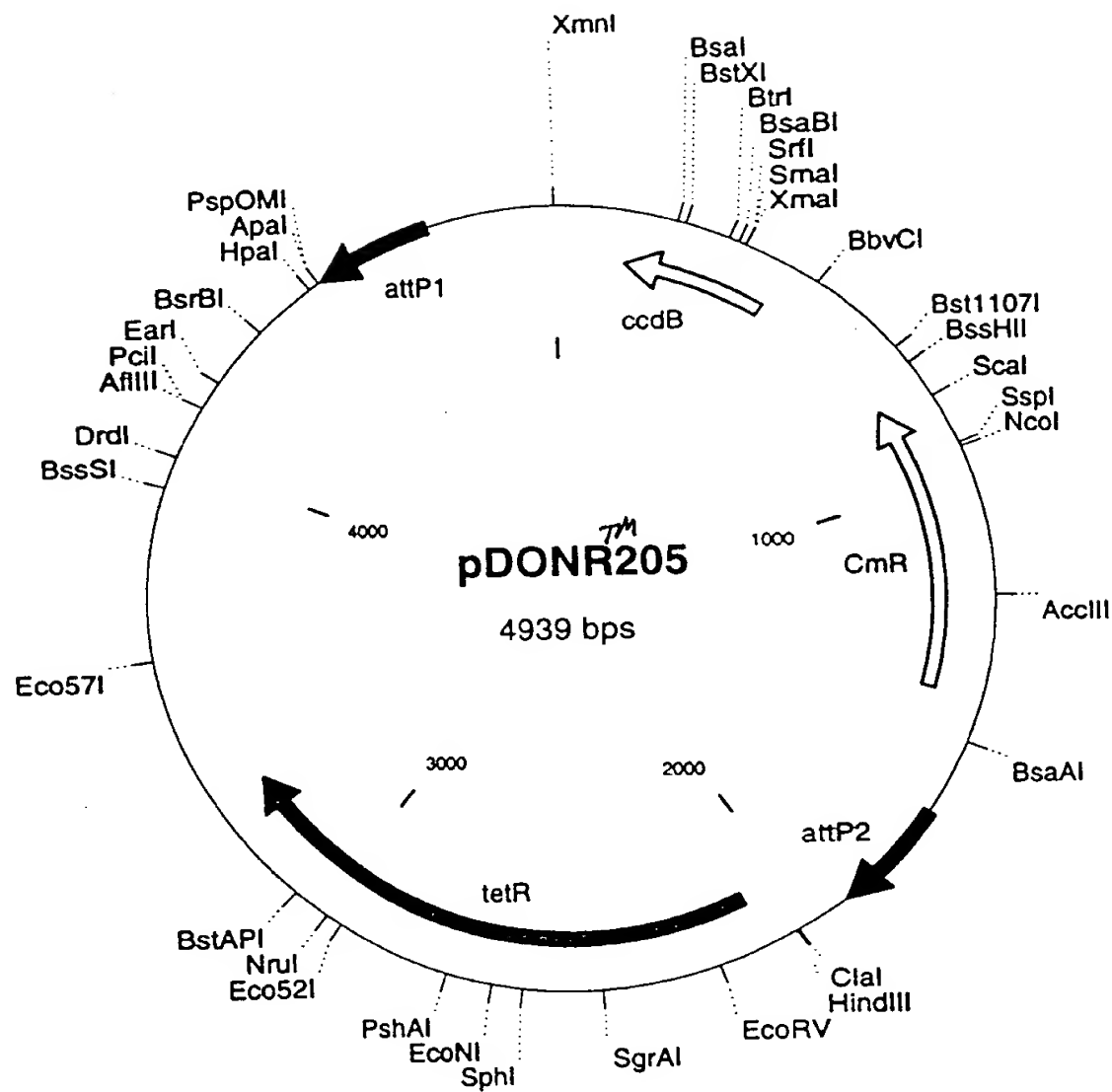
1 CGGCATTGAG GACAATAGCG AGTAGGCTGG ATACGACGAT TCCGTTTGAG AAGAACATTT
61 GGAAGGCTGT CGGTCGACTA CAGGTCACCTA ATACCATCTA AGTAGTTGAA TCATAGTGAC
121 TGGATATGTT GTGTTTTTACA GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT
181 ATATTGATAT TTATATCATT TTACGTTTCT CGTTCAGCTT TTTTGTACAA AGTTGGCATT
241 ATAAAAAAGC ATTGCTTATC AATTTGTTGC AACGAACAGG TCACTATCAG TCAAAATAAA
301 ATCATTATTT GGGGCCCGAG ATCCATGCTA GCTGCAGTGC GCAGGGCCCG TGTCTCAAAA
361 TCTCTGATGT TACATTGCAC AAGATAAAAA TATATCATCA TGAACAATAA AACTGTCTGC
421 TTACATAAAC AGTAATACAA GGGGTGTTAT GAGCCATATT CAACGGGAAA CGTCTTGCTG
481 GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTATAT GGGTATAAAT GGGCTCGCGA
541 TAATGTCGGG CAATCAGGTG CGACAATCTT TCGATTGTAT GGAAGCCCG ATGCGCCAGA
601 GTTGTTTCTG AAACATGGCA AAGGTAGCGT TGCCAATGAT GTTACAGATG AGATGGTCAG
661 ACTAAACTGG CTGACGGAAT TTATGCCTCT TCCGACCATC AAGCATTTTA TCCGTACTCC
721 TGATGATGCA TGGTTACTCA CCACTGCGAT CCGCGGGAAA ACAGCATTCG AGGTATTAGA
781 AGAATATCCT GATTGAGGTG AAAATATTGT TGATGCGCTG GCAGTGTTCC TGCGCCGGTT
841 GCATTGATTT CCTGTTTGTG ATTGTCCTTT TAACAGCGAT CGCGTATTTT GTCTCGCTCA
901 GGCGCAATCA CGAATGAATA ACGGTTTGGT TGATGCGAGT GATTTTGATG ACGAGCGTAA
961 TGGCTGGCCT GTTGAACAAG TCTGGAAAGA AATGCATACG CTTTTGCCAT TCTCACCAGA
1021 TTCAGTCGTC ACTCATGGTG ATTTCTCACT TGATAACCTT ATTTTGTGAC AGGGGAAATT
1081 AATAGGTTGT ATTGATGTTG GACGAGTCGG AATCGCAGAC CGATACCAGG ATCTTGCCAT
1141 CCTATGGAAC TGCCTCGGTG AGTTTTCTCC TTCATTACAG AAACGGCTTT TTCAAAAATA
1201 TGGTATTGAT AATCCTGATA TGAATAAATT GCAGTTTCAT TTGATGCTCG ATGAGTTTTT
1261 CTAATCAGAA TTGGTTAATT GGTGTGAACA CTGGCAGAGC ATTACGCTGA CTTGACGGGA
1321 CGGCGNCATG ACCAAAATCC CTTAACGTGA GTTTTCGTTT CACTGAGCGT CAGACCCCGT
1381 AGAAAAGATC AAAGGATCTT CTTGAGATCC TTTTTTCTG CGCGTAATCT GCTGCTTGCA
1441 AACAAAAAAA CCACCGCTAC CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT
1501 TTTTCCGAAG GTAACCTGGT TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTAGTGTA
1561 GCCGTAGTTA GGCCACCACT TCAAGAACTC TGTAGCACC GCTACATACC TCGCTCTGCT
1621 AATCCTGTTA CCAGTGGCTG CTGCCAGTGG CGATAAGTCG TGTCTTACCG GGTGGAATC
1681 AAGACGATAG TTACCGGATA AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGACACAC
1741 GCCCAGCTTG GAGCGAACGA CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA
1801 AAGCGCCACG CTTCCCGAAG GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCGG
1861 AACAGGAGAG CGCACGAGGG AGCTTCCAGG GGGAAACGCC TGGTATCTTT ATAGTCCTGT
1921 CGGGTTTCGC CACCTCTGAC TTGAGCGTCG ATTTTGTGTA TGCTCGTCAG GGGGGCGGAG
1981 CCTATGGAAA AACGCCAGCA ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT
2041 TGCTCACATG TTCTTTCCTG CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCTAG
2101 CTGGATCGGC AAATAATGAT TTTATTTTGA CTGATAGTGA CCTGTTCGTT GCAACAAATT
2161 GATAAGCAAT GCTTTTTTTT AATGCCAACT TTGTACAAGA AAGCTGAACG AGAAACGTAA
2221 AATGATATAA ATATCAATAT ATTAAATTAG ATTTTGCATA AAAAACAGAC TACATAATAC
2281 TGTAACACAC AACATATCCA GTCACATGTA TTCAACTACT TAGATGGTAT TAGTGACCTG
2341 TAGTCGACTA AGTTGGCAGC ATCACCCGAC GCACTTTGCG CCGAATAAAT ACCTGTGACG
2401 GAAGATCACT TCGCAGAATA AATAAATCCT GGTGTCCCTG TTGATACCGG GAAGCCCTGG
2461 GCCAACTTTT GGCAGAAATG AGACGTTGAT CGGCACATTT CACAACCTCT ATACTTTTCT
2521 CTTACAAGTC GTTCGGCTTC ATCTGGATTT TCAGCCTCTA TACTTACTAA ACGTGATAAA
2581 GTTCTGTGTA TTTCTACTGT ATCGACCTGC AGACTGGCTG TGTATAACGG AGCCTGACAT
2641 TTATATTCCC CAGAACATCA GGTAAATGGC GTTTTGTGAT TCATTTTCGC GGTGGCTGAG
2701 ATCAGCCACT TCTTCCCCGA TAACGGAGAC CGGCACACTG GCCATATCGG TGGTCATCAT
2761 GCGCCAGCTT TCATCCCCGA TATGCACCAC CGGGTAAAGT TCACGGGAGA CTTTATCTGA
2821 CAGCAGACGT GCACTGGCCA GGGGGATCAC CATCCGTCGC CCGGGCGTGT CAATAATATC
2881 ACTCTGTACA TCCACAAACA GACGATAACG GCTCTCTCTT TTATAGGTGT AAACCTTAAA
2941 CTGCATTTCA CCAGTCCCTG TTCTCGTCAG CAAAAGAGCC GTTCATTTCA ATAAACCGGG
3001 CGACCTCAGC CATCCCTTCC TGATTTTCCG CTTTCCAGCG TTCGGCACGC AGACGACGGG
3061 CTTCAATTCTG CATGGTTGTG CTTACCAGAC CGGAGATATT GACATCATAT ATGCCTTGAG
3121 CAACTGATAG CTGTGCTGTG CAACTGTCAC TGTAATACGC TGCTTCATAG CACACCTCTT-

FIGURE 52B

3181 TTTGACATAC TTCGGGTATA CATATCAGTA TATATTCTTA TACCGCAAAA ATCAGCGCGC
 3241 AAATACGCAT ACTGTTATCT GGCTTTTAGT AAGCCGGATC CACGCGTTTA CGCCCCGCCC
 3301 TGCCACTCAT CGCAGTACTG TTGTAATTCA TTAAGCATTC TGCCGACATG GAAGCCATCA
 3361 CAGACGGCAT GATGAACCTG AATCGCCAGC GGCATCAGCA CCTTGTCGCC TTGCGTATAA
 3421 TATTTGCCCC TGGTGAAAAC GGGGGCGAAG AAGTTGTCCA TATTGGCCAC GTTTAAATCA
 3481 AAACCTGGTGA AACTCACCCA GGGATTGGCT GAGACGAAAA ACATATTCTC AATAAACCCCT
 3541 TTAGGGAAAT AGGCCAGGTT TTCACCGTAA CACGCCACAT CTTGCGAATA TATGTGTAGA
 3601 AACTGCCGGA AATCGTCGTG GTATTCACTC CAGAGCGATG AAAACGTTTC AGTTTGCTCA
 3661 TGGAAAACGG TGTAACAAGG GTGAACACTA TCCCATATCA CCAGCTCACC GTCTTTCATT
 3721 GCCATACGGA ATTCCGGATG AGCATTCATC AGGCGGGCAA GAATGTGAAT AAAGGCCGGA
 3781 TAAAACCTTGT GCTTATTTTT CTTTACGGTC TTTAAAAAGG CCGTAATATC CAGCTGAACG
 3841 GTCTGGTTAT AGGTACATTG AGCAACTGAC TGAAATGCCT CAAAATGTTC TTTACGATGC
 3901 CATTGGGATA TATCAACGGT GGTATATCCA GTGATTTTTT TCTCCATTTT AGCTTCCTTA
 3961 GCTCCTGAAA ATCTCGATAA CTCAAAAAAT ACGCCCGGTA GTGATCTTAT TTCATTATGG
 4021 TGAAAGTTGG AACCTCTTAC TGTCTTGAT GCAGATGATT TTCAGGACTA TGACACTAGC
 4081 ATATATGAAT AGGTAGATGT TTTTATTTTG TCACACAAAA AAGAGGCTCG CACCTCTTTT
 4141 TCTTATTCT TTTTATGATT TAATA

FIGURE 52C

Figure 53A: pDONR205 (tetR)

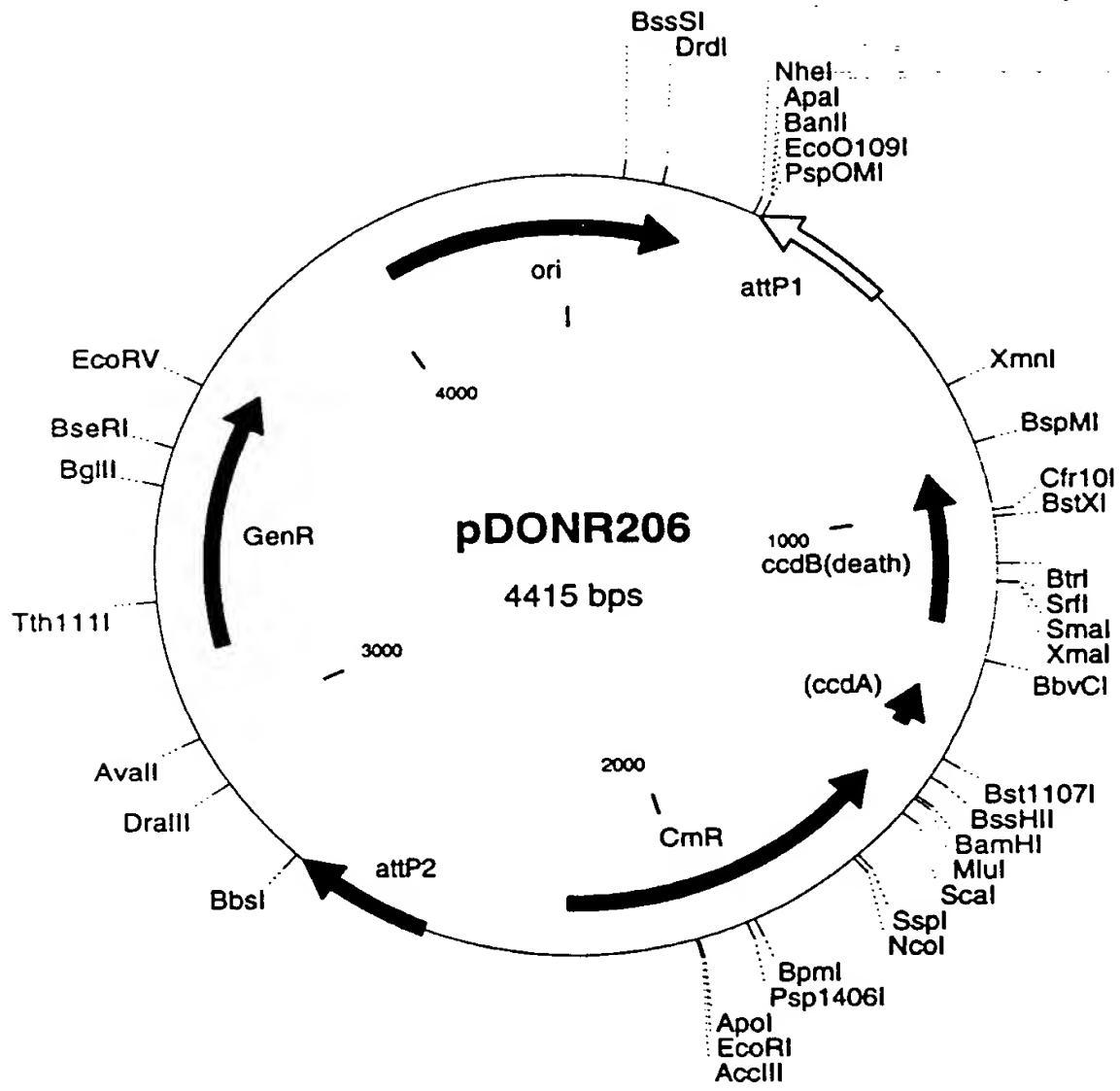


pDONR205 4939 bp

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GAGACGAAAAACATATTCTCAATAAACCTTTAGGGAAATAGGCCAGGTTTTCACCGTAA
CACGCCACATCTTGCGAATATATGTGTAGAACTGCCGGAATCGTCGTGGTATTCACCTC
CAGAGCGATGAAAACGTTTCAGTTTGCTCATGGAAAACGGTGTAACAAGGGTGAACACTA
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AGGCGGGCAAGAATGTGAATAAAGGCCGATAAACTTGTGCTTATTTTTCTTTACGGTC
TTTAAAAAGGCCGTAATATCCAGCTGAACGGTCTGGTTATAGGTACATTGAGCAACTGAC
TGAAATGCCTCAAAATGTTCTTTACGATGCCATTGGGATATATCAACGGTGGTATATCCA
GTGATTTTTTTCTCCATTTTAGCTTCCTTAGCTCCTGAAAATCTCGATAACTCAAAAAT
ACGCCCCGGTAGTGATCTTATTTTATTATGGTGAAAGTTGGAACCTCTTACGTGCCGATCA
ACGTCTCATTTTTCGCCAAAAGTTGGCCAGGGCTTCCCGGTATCAACAGGGACACCAGGA
TTTATTTATTCTGCGAAGTGATCTTCCGTACAGGTATTTATTCGGCGCAAAGTGCGTCG
GGTGATGCTGCCAACTTAGTCGACTACAGGTCATAATACCATCTAAGTAGTTGATTTCAT
AGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTAA
TTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTCAGCTTTCCTTGACAAAGTT
GGCATTATAAGAAAGCATTGCTTATCAATTTGTTGCAACGAACAGGTCACTATCAGTCAA
AATAAAATCATTATTTGCCATCCAGCTGCAGCTCTGGCCCGTGTCTCAAATCTCTGATG
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ATGAAATCTAACAAATGCGCTCATCGTCATCCTCGGCACCGTCACCCTGGATGCTGTAGGC
ATAGGCTTGGTTATGCCGGTACTGCCGGGCTCTTGCGGGATATCGTCCATTCCGACAGC
ATCGCCAGTCACTATGGCGTGCTGCTAGCGCTATATGCGTTGATGCAATTTCTATGCGCA
CCCGTTCTCGGAGCACTGTCCGACCGCTTTGGCCGCCGCCAGTCCTGCTCGCTTCGCTA
CTTGAGCCACTATCGACTACGCGATCATGGCGACCACACCCGTCCTGTGGATCCTCTAC
GCCGACGCATCGTGGCCGGCATCACCGGCCGCCACAGGTGCGGTTGCTGGCGCCTATATC
GCCGACATCACCGATGGGGAAGATCGGGCTCGCCACTTCGGGCTCATGAGCGCTTGTTTC
GGCGTGGGTATGGTGGCAGGCCCCGTGGCCGGGGGACTGTTGGGCGCCATCTCCTTGCA
GCACCATTCCTTGCGGCGGCGGTGCTCAACGGCCTCAACCTACTACTGGGCTGCTTCCTA
ATGCAGGAGTCGCATAAGGGAGAGCGTCGACCGATGCCCTTGAGAGCCTTCAACCCAGTC
AGCTCCTTCCGGTGGGCGCGGGGCATGACTATCGTCGCCGCACTTATGACTGTCTTCTTT
ATCATGCAACTCGTAGGACAGGTGCCGGCAGCGCTCTGGGTCATTTTCGGCGAGGACCGC
TTTCGCTGGAGCGCGACGATGATCGGCCTGTGCTTGGCGTATTCGGAATCTTGACGCC
CTCGCTCAAGCCTTCGTCACTGGTCCCGCCACCAACGTTTCGGCGAGAAGCAGGCCATT
ATCGCCGGCATGGCGGCCGACGCGCTGGGCTACGTCTTGCTGGCGTTTCGCGACGCGAGGC
TGGATGGCCTTCCCCATTATGATTCTTCTCGCTTCCGGCGGCATCGGGATGCCCGCGTTG
CAGGCCATGCTGTCCAGGCAGGTAGATGACGACCATCAGGGACAGCTTCAAGGATCGCTC
GCGGCTCTTACCAGCCTAACTTCGATCATTGGACCGCTGATCGTCACGGCGATTTATGCC
GCCTCGGCGAGCACATGGAACGGGTGGCATGGATTGTAGGCGCCGCCCTATACCTTGTC
TGCTTCCCCGCGTTGCGTCGCGGTGCATGGAGCCGGGCCACCTCGACCTGAATGGAAGCC
GGCGGCACCTCGCTAACGGATTCAACCACTCCAAGAATTGGAGCCAATCAATTCTTGCGGA
GAACTGTGAATGCGCAAACCAACCCTTGGCAGAACATATCCATCGCATGACCAAAATCCC
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TTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACC
AGCGGTGGTGTGTTTGCCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTT
CAGCAGAGCGCAGATACCAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTT
CAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACAGTGGCTGC
TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAA
GGCGCAGCGGTGCGGCTGAACGGGGGGTTCGTGCACACAGCCAGCTTGGAGCGAACGAC
CTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGG
GAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGA
GCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTTCGCCACCTCTGACT
TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGAAAAACGCCAGCAA-

FIGURE 53B

Figure 54A pDONR206 (genR)



pDONR206 4415 bp

CGGCATTGAGGACAATAGCGAGTAGGCTGGATACGACGATTCCGTTTGAGAAGAACATTT
GGAAGGCTGTCGGTTCGACTACAGGTCACCTAATACCATCTAAGTAGTTGAATCATAGTGAC
TGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTAAT
ATATTGATATTTATATCATTTTTACGTTTCTCGTTCAGCTTTTTTGTACAAAGTTGGCATT
ATAAAAAAGCATTGCTTATCAATTTGTTGCAACGAACAGGTCACCTATCAGTCAAAATAAA
ATCATTATTTGGGGCCCGAGATCCATGCTAGCGGTAATACGGTTATCCACAGAATCAGGG
GATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAG
GCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGA
CGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATAACCAGGCGTTTCCCCCT
GGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCC
TTTCTCCCTTCGGGAAGCGTGGCGCTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCTG
GTGTAGGTCGTTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCCGACCGC
TGCGCCTTATCCGGTAACCTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCA
CTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAG
TTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCT
CTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACC
ACCGCTGGTAGCGGTGGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGA
TCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACCTCA
CGTTAAGGGATTTTGGTCATGNCGCCGTCCCGTCAAGTCAGCGTAATGCTCTGCCAGTGT
TACAACCAATTAACCAATTCTGATTAGAAAACTCATCGAGCATCAAATGAACTGCAAT
TTATTCATATCAGGATTATCAATACCATATTTTTGAAAAAGCCGTTTCTGTAATGAAGGA
GAAAACTCACCGAGGCAGTTCCATAGGATGGCAAGATCCTGGTATCCGGTCTGCGATTCCG
ACTCGTCCAACATCAATACAACCTATTAGCCGAGGTCTTCCGATCTCCTGAAGCCAGGGC
AGATCCGTGCACAGCACCTTGCCGTAGAAGAACAGCAAGGCCGCCAATGCCTGACGATGC
GTGGAGACCGAAACCTTGCGCTCGTTCGCCAGCCAGGACAGAAATGCCTCGACTTCGCTG
CTGCCCAAGGTGCGGGGTGACGCACACCGTGGAACGGATGAAGGCACGAACCCAGTTG
ACATAAGCCTGTTTCGGTTCGTAACTGTAATGCAAGTAGCGTATGCGCTCACGCAACTGG
TCCAGAACCTTGACCGAACGCAGCGGTGGTAACGGCGCAGTGGCGGTTTTTCATGGCTTGT
TATGACTGTTTTTTTTGTACAGTCTATGCCTCGGGCATCCAAGCAGCAAGCGCGTTACGCC
GTGGGTGATGTTTGTATGTTATGGAGCAGCAACGATGTTACGCAGCAGCAACGATGTTAC
GCAGCAGGGCAGTCGCCCTAAACAAGTTAGGTGGCTCAAGTATGGGCATCATTCGCAC
ATGTAGGCTCGGCCCTGACCAAGTCAAATCCATGCGGGCTGCTCTTGATCTTTTCGGTCTG
TGAGTTCGGAGACGTAGCCACCTACTCCCAACATCAGCCGGACTCCGATTACCTCGGGAA
CTTGCTCCGTAGTAAGACATTATCGCGCTTGCTGCCTTCGACCAAGAAGCGGTTGTTGG
CGCTCTCGCGGCTTACGTTCTGCCCAGGTTTGAGCAGCCGCGTAGTGAGATCTATATCTA
TGATCTCGCAGTCTCCGGCGAGCACCGGAGGCAGGGCATTGCCACCGCGCTCATCAATCT
CCTCAAGCATGAGGCCAACGCGCTTGGTGCTTATGTGATCTACGTGCAAGCAGATTACGG
TGACGATCCCGCAGTGGCTCTCTATACAAAGTTGGGCATACGGGAAGAAGTGATGCACTT
TGATATCGACCCAAGTACCGCCACCTAACAATTCGTTCAAGCCGAGATCGGCTTCCCCGGC
CTAATTTCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGACGACTG
AATCCGGTGAGAATGGCAAAAGCGTATGCATTTCTTTCCAGACTTGTTCAACAGGCCAGC
CATTACGCTCGTCATCAAAATCACTCGCATCAACCAAACCGTTATTCAATTCGTGATTGCG
CCTGAGCGAGACGAAATACGCGATCGCTGTTAAAGGACAATTACAAACAGGAATCGAAT
GCAACCGGCGCAGGAACACTGCCAGCGCATCAACAATATTTTACCTGAATCAGGATATT
CTTCTAATACCTGGAATGCTGTTTTCCCGCGGATCGCAGTGGTGAGTAACCATGCATCAT
CAGGAGTACGGATAAAATGCTTGATGGTCCGAAGAGGCATAAATCCGTCAGCCAGTTTA
GTCTGACCATCTCATCTGTAACATCATTGGCAACGCTACCTTTGCCATGTTTCAGAAACA
ACTCTGGCGCATCGGGCTTCCCATACAATCGAAAGATTGTCGCACCTGATTGCCCCGACAT
TATCGCGAGCCCATTTATACCCATATAAATCAGCATCCATGTTGGAATTTAATCGCGGCC
TCCAGCAAGACGTTTTCCCGTTGAATATGGCTCATAACACCCCTTGTATTACTGTTTATGT
AAGCAGACAGTTTTATTGTTTATGATGATATATTTTTATCTTGTGCAATGTAACATCAGA
GATTTTGAGACACGGGCCNGCGCACTGCAGCTGGATCGGCAAATAATGATTTTATTTTG
ACTGATAGTGACCTGTTTCGTTGCAACAAATTGATAAGCAATGCTTTTTTATAATGCCAAC -

FIGURE 54B

TTTGTACAAGAAAGCTGAACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTA
GATTTTGCATAAAAAACAGACTACATAATACTGTAAAACACAACATATCCAGTCACTATG
ATTCAACTACTTAGATGGTATTAGTGACCTGTAGTCGACTAAGTTGGCAGCATCACCCGA
CGCACTTTGCGCCGAATAAATACCTGTGACGGAAGATCACTTCGCAGAATAAATAAATCC
TGGTGTCCCTGTTGATACCGGGAAGCCCTGGGCCAACTTTTGGCGAAAATGAGACGTTGA
TCGGCACGTAAGAGGTTCCAACCTTTCACCATAATGAAATAAGATCACTACCGGGCGTATT
TTTTGAGTTATCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGG
ATATAACCACCGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGAGGCATTTTCAGTC
AGTTGCTCAATGTACCTATAACCAGACCGTTCAGCTGGATATTACGGCCTTTTTTAAAGAC
CGTAAAGAAAAATAAGCACAGTTTATCCGGCCTTTATTACATTCTTGCCCGCCTGAT
GAATGCTCATCCGGAATTCCGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAG
TGTTCAACCCTTGTTACACCGTTTTCCATGAGCAAACGTAAACGTTTTTCATCGCTCTGGAG
TGAATACCACGACGATTTCCGGCAGTTTCTACACATATATTCGCAAGATGTGGCGTGTTA
CGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTATTGAGAATATGTTTTTTCGTCTCAGC
CAATCCCTGGGTGAGTTTCACCAGTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTT
CGCCCCCGTTTTTACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCT
GGCGATTACAGGTTTCATCATGCCGTCTGTGATGGCTTCCATGTCCGCAGAATGCTTAATGA
ATTACAACAGTACTGCGATGAGTGGCAGGGCGGGGCGTAAACGCGTGGATCCGGCTTACT
AAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAATATATAC
TGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTG
ACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTC
TGGTAAGCACAACCATGCAGAATGAAGCCCGTCGTCTGCGTGCCGAACGCTGGAAAGCGG
AAAATCAGGAAGGGATGGCTGAGGTGCCCCGGTTTTATTGAAATGAACGGCTCTTTTGCTG
ACGAGAACAGGGACTGGTGAAATGCAGTTTAAGGTTTACACCTATAAAAGAGAGAGCCGT
TATCGTCTGTTTGTGGATGTACAGAGTGATATTATTGACACGCCCGGGCGACGGATGGTG
ATCCCCCTGGCCAGTGCACGTCTGCTGTCAGATAAAGTCTCCCGTGAACCTTTACCCGGTG
GTGCATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTC
TCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCC
ATTAACCTGATGTTCTGGGGAATATAAATGTCAGGCTCCGTTATACACAGCCAGTCTGCA
GGTCGATACAGTAGAAATTACAGAACTTTATCACGTTTAGTAAGTATAGAGGCTGAAAA
TCCAGATGAAGCCGAACGACTTGTAAGAGAAAAGTATAAGAGTTGTGAAATTGTTCTTGA
TGCAGATGATTTTCAGGACTATGACACTAGCATATATGAATAGGTAGATGTTTTTATTTT
GTCACACAAAAAAGAGGCTCGCACCTCTTTTTCTTATTTCTTTTTATGATTTAATA

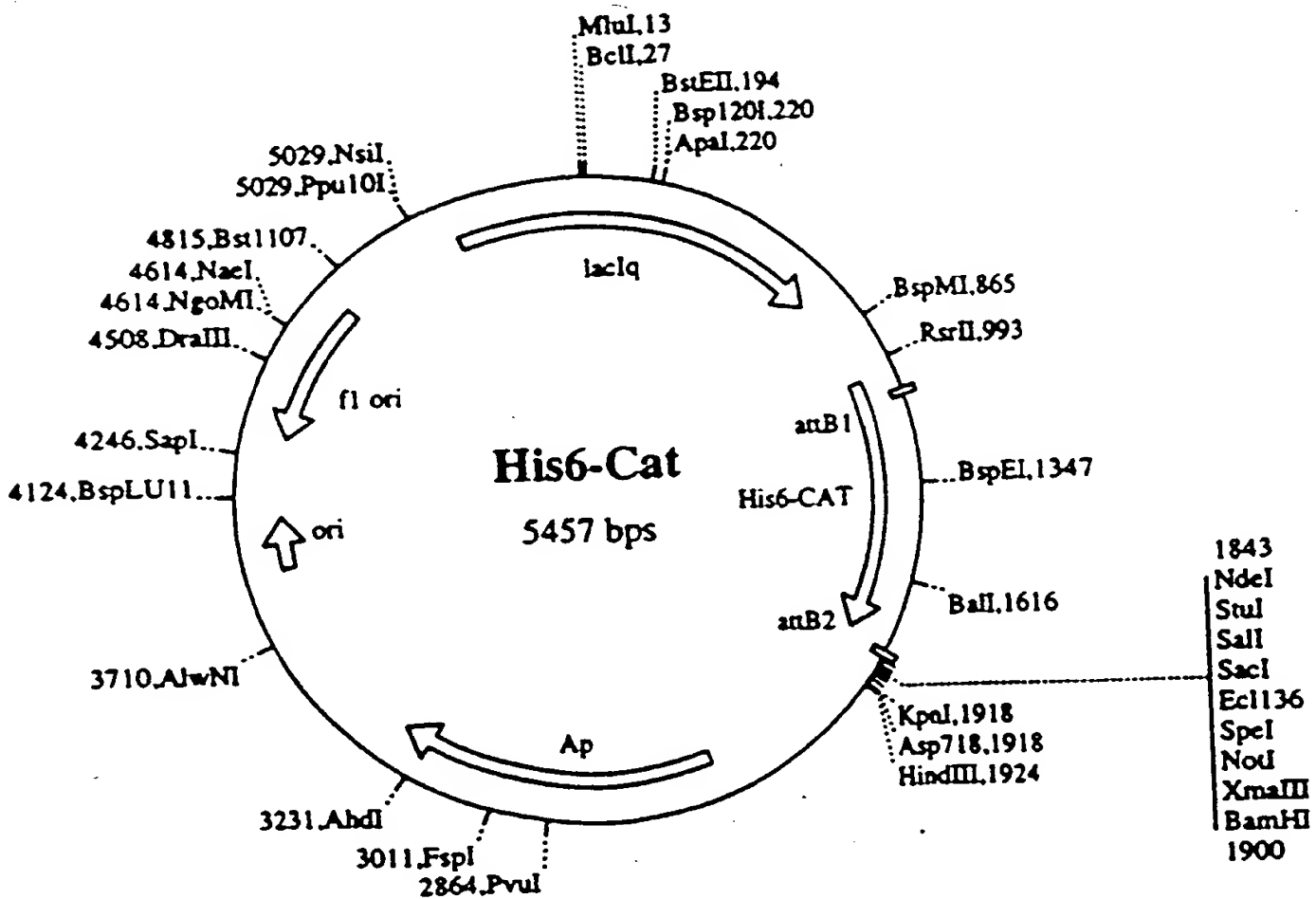
FIGURE 54 C

Figure 55 An Entry (pENTR7) Clone of CAT Subcloned into pDEST2

1021 cgg ata aca att tca cac agg aaa cag acc ^{Start translation} atg tcg tac tac ^{Met Ser Tyr Tyr} ^{His His His} cat cac cat
gcc tat tgt taa agt gtg tcc ttt gtc tgg tac agc atg atg gta gtg gta

1072 His His His Gly Ile Thr Ser Leu Tyr Lys Lys Ala Gly Phe Gly Asn Leu
cac cat cac ggc atc aca agt ttg tac aaa aaa gca ggc ttt gaa aac ctg
gtg gta gtg ccg tag tgt tca aac atg ttt ttt cgt ccg aaa ctt ttg gac
From pDEST2 From pENTR7

TEV protease 1123 Tyr Phe Gln Gly Thr Met Gly Lys Lys Ile Thr Gly Tyr Thr Thr Val Asp
tat ttt caa gga acc atg gag aaa aaa atc act gga cat acc acc gtt gat
ata aaa gtt cct tgg tac ctc ttt ttt tag tga cct ata tgg tgg caa cta



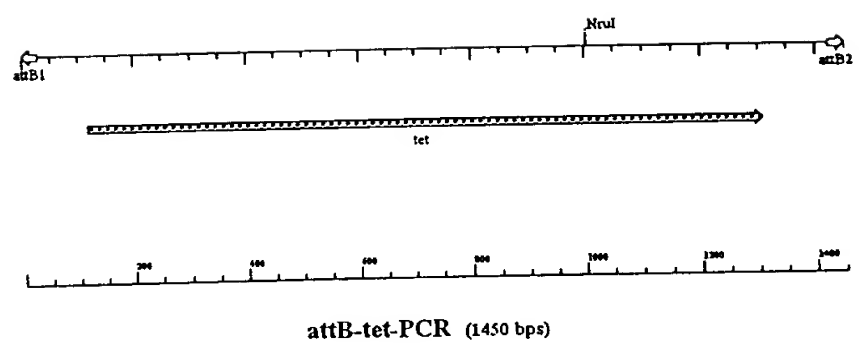
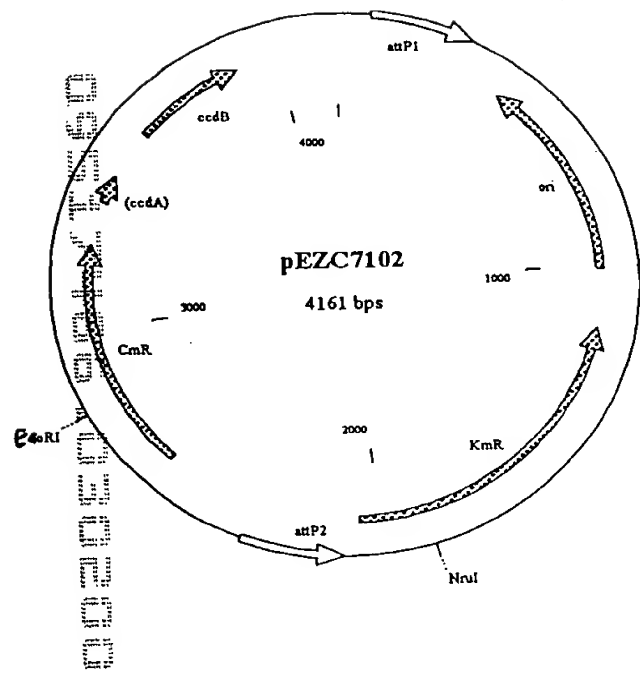


FIGURE 56

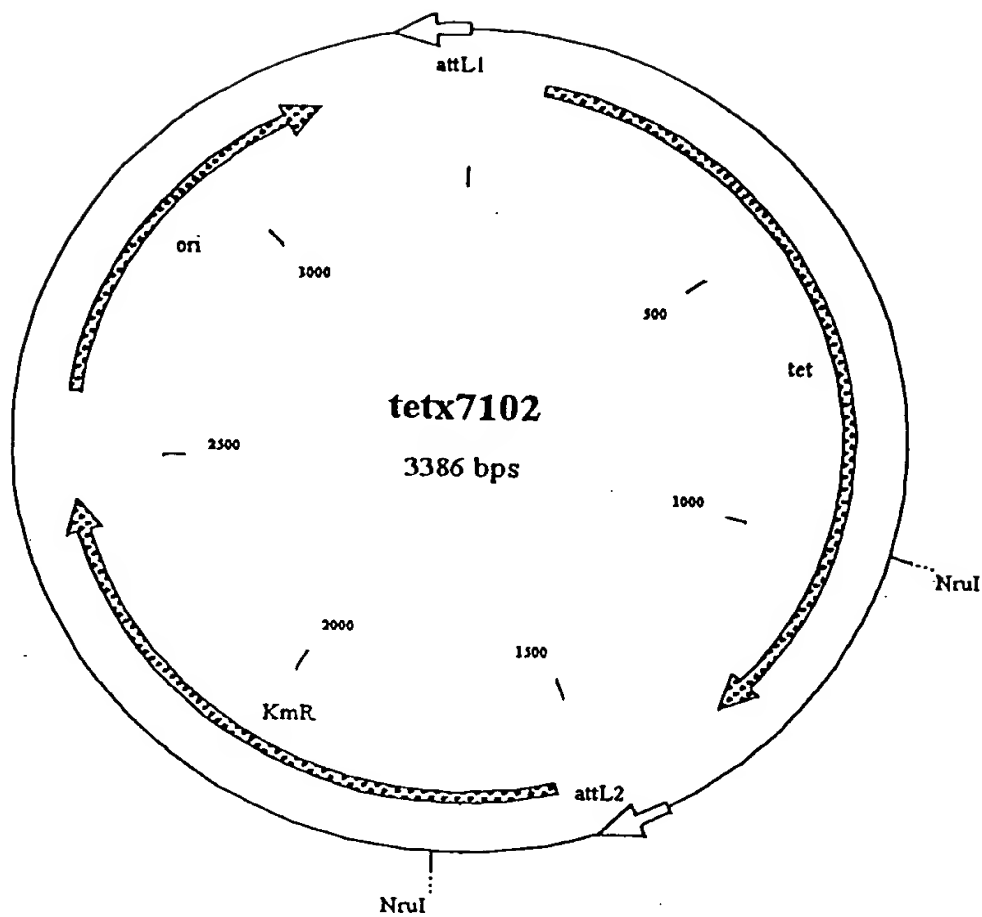


FIGURE 57

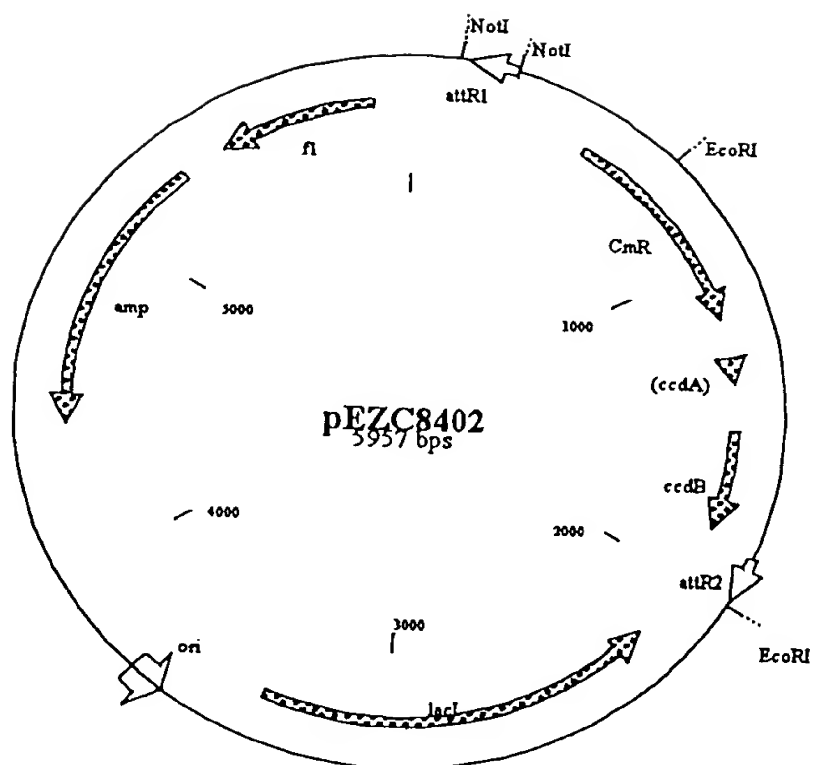
[illegible]

FIGURE 58

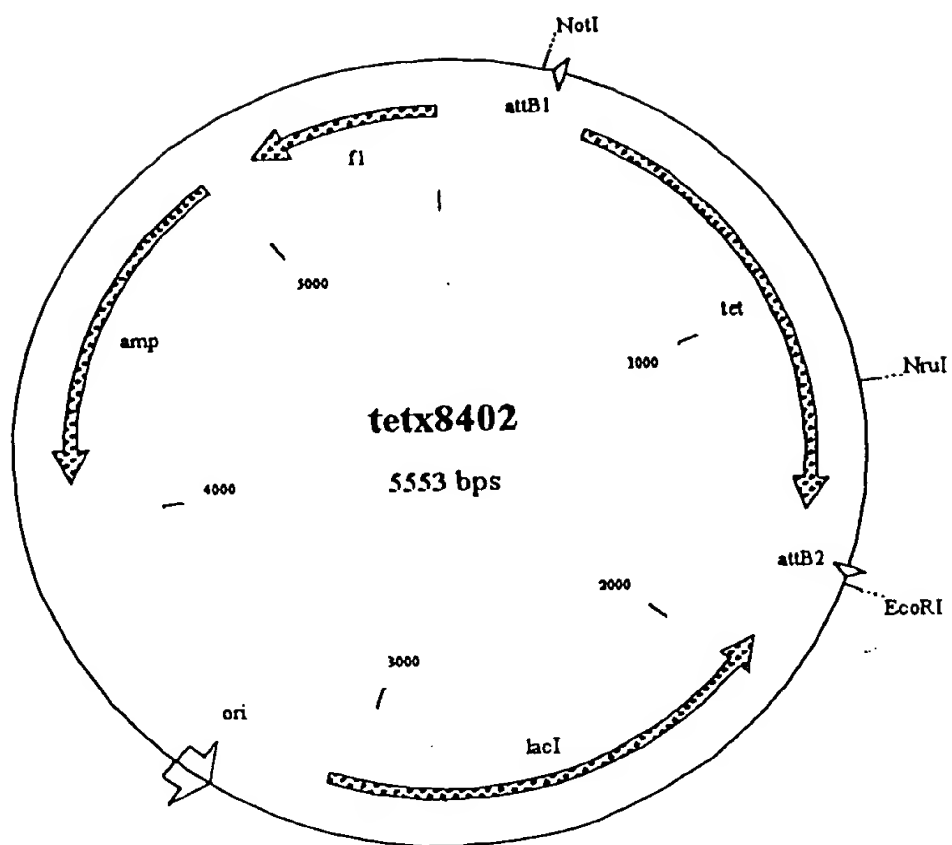


FIGURE 59

The diagram illustrates the integration and excision of Phage Lambda into the E. coli genome. At the top, a circular representation of the **Phage Lambda** genome is shown, containing the **attP (245 bp)** site, which is divided into three regions labeled 1, 2, and 5. Region 2 is shaded with a cross-hatch pattern. Below this, a horizontal line represents the **E. coli Genome**, which contains the **attB (25 bp)** site, divided into three regions labeled 4, 2, and 3. Region 2 is shaded with a cross-hatch pattern. A large 'X' symbol indicates the initial state before integration. Below the 'X', two vertical arrows indicate the processes of **Integration** (downward arrow, labeled with **(Int, IHF)**) and **Excision** (upward arrow, labeled with **(Int, Xis, IHF)**). At the bottom, the integrated state is shown: the **E. coli Genome** contains the **attL** site (regions 4, 2, 5) and the **attR** site (regions 1, 2, 3), while the **Lambda Genome** is integrated between them. The **attL** and **attR** sites are shaded with cross-hatch patterns, and the **Lambda Genome** is represented by a solid black bar.

FIGURE 60

002060 00471650

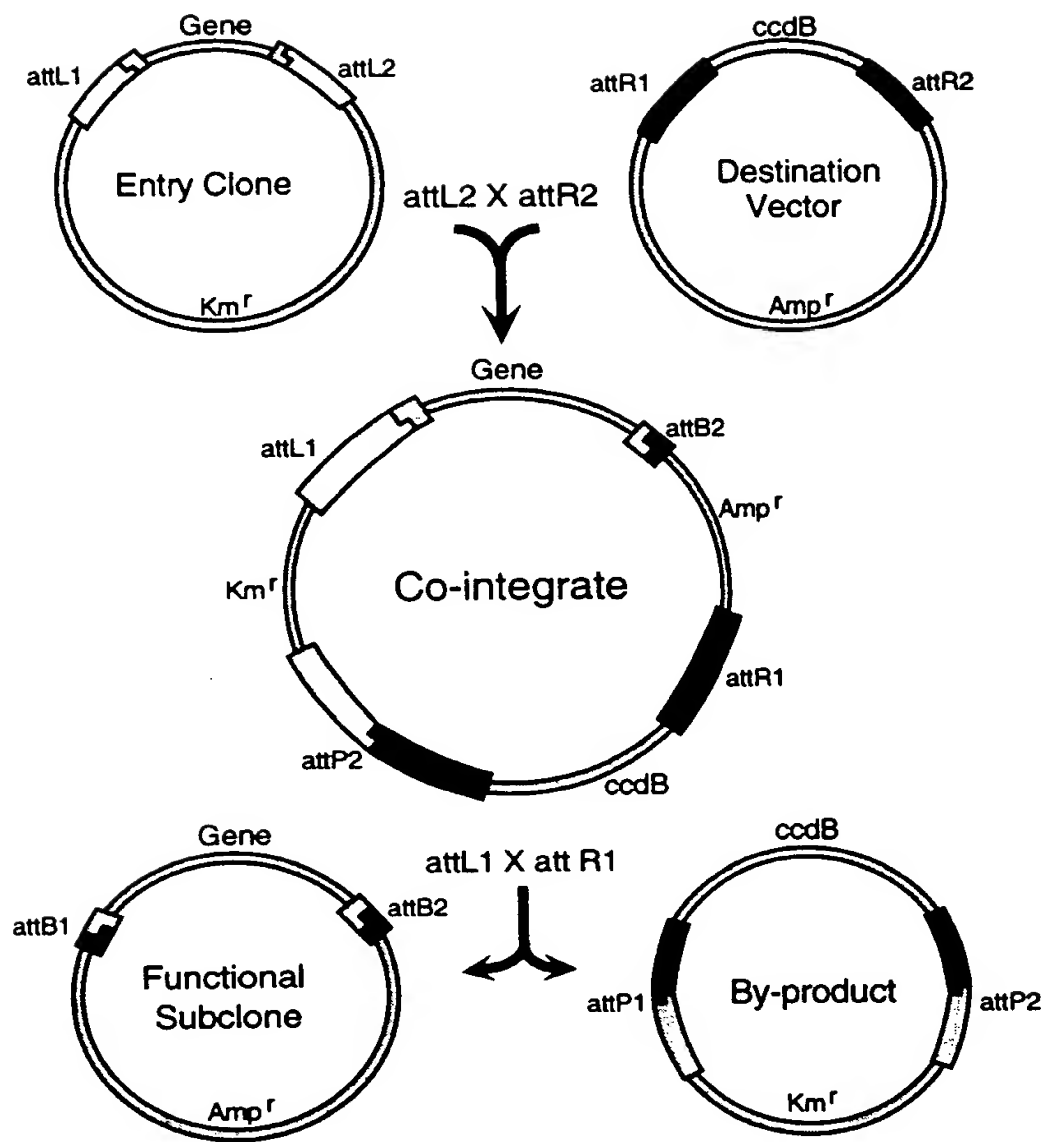
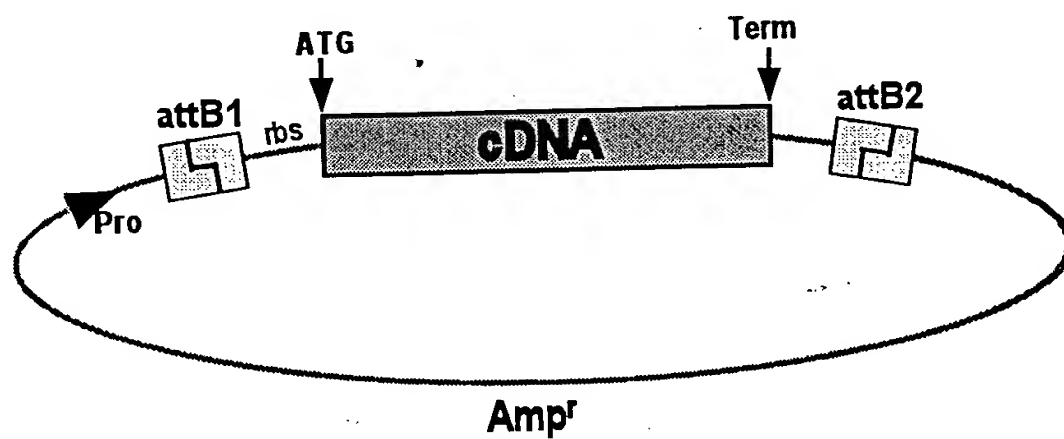


FIGURE 61

002050 0347660

Native Protein Expression:



Fusion Protein Expression:

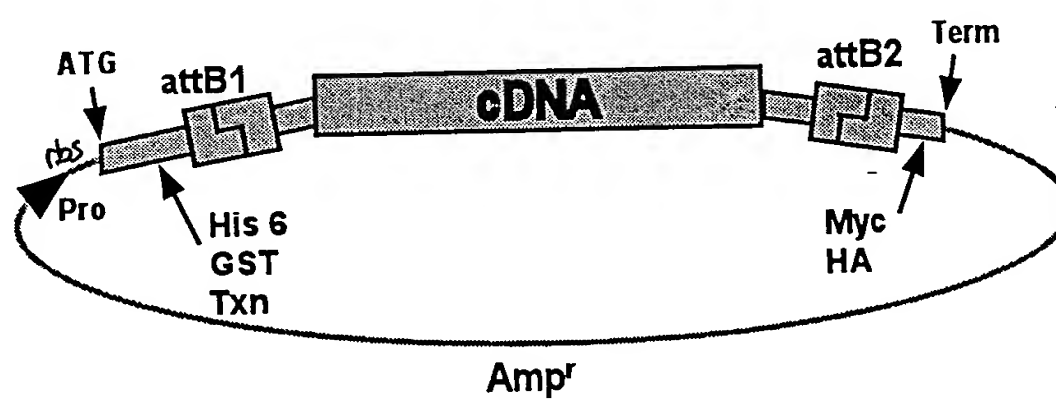


FIGURE 62

SECRET

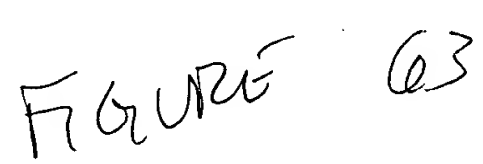


FIGURE 63

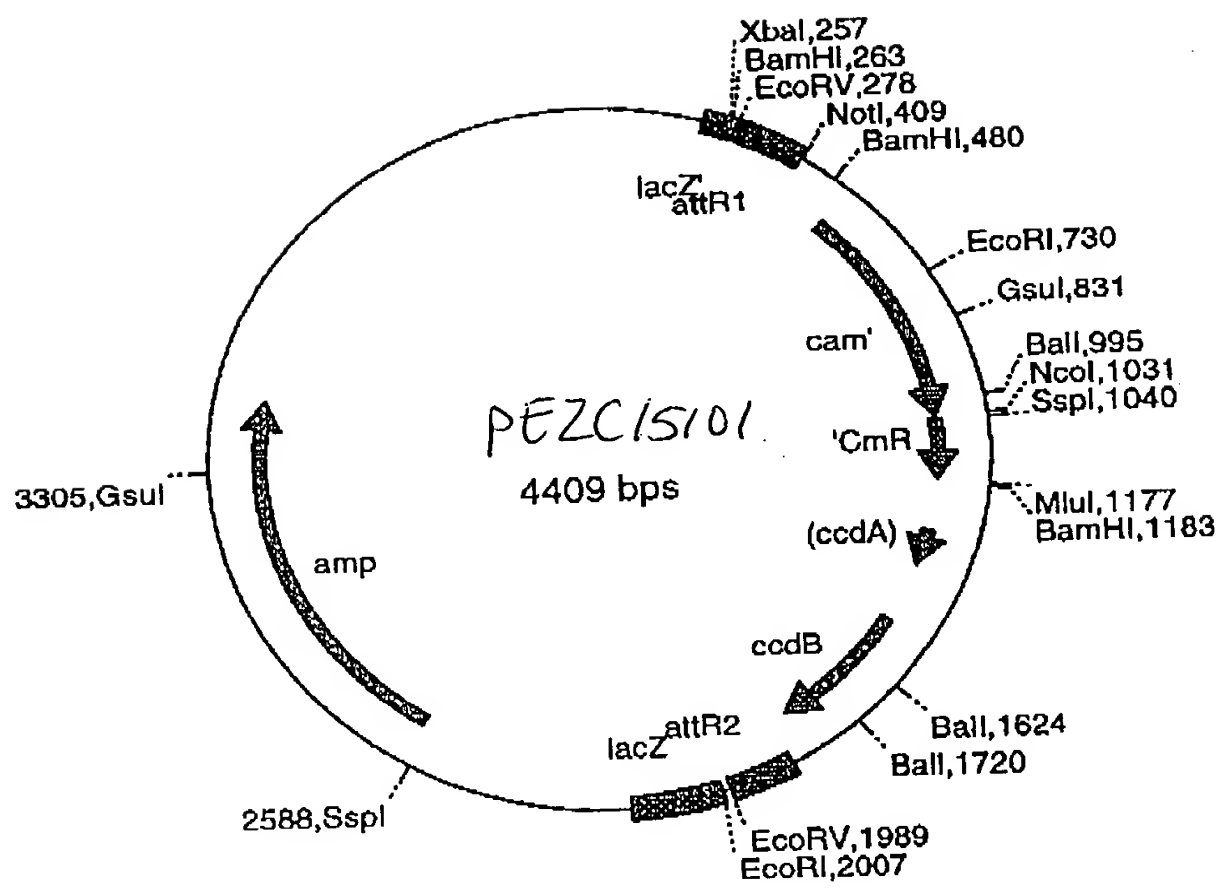
[illegible]

FIGURE 4B

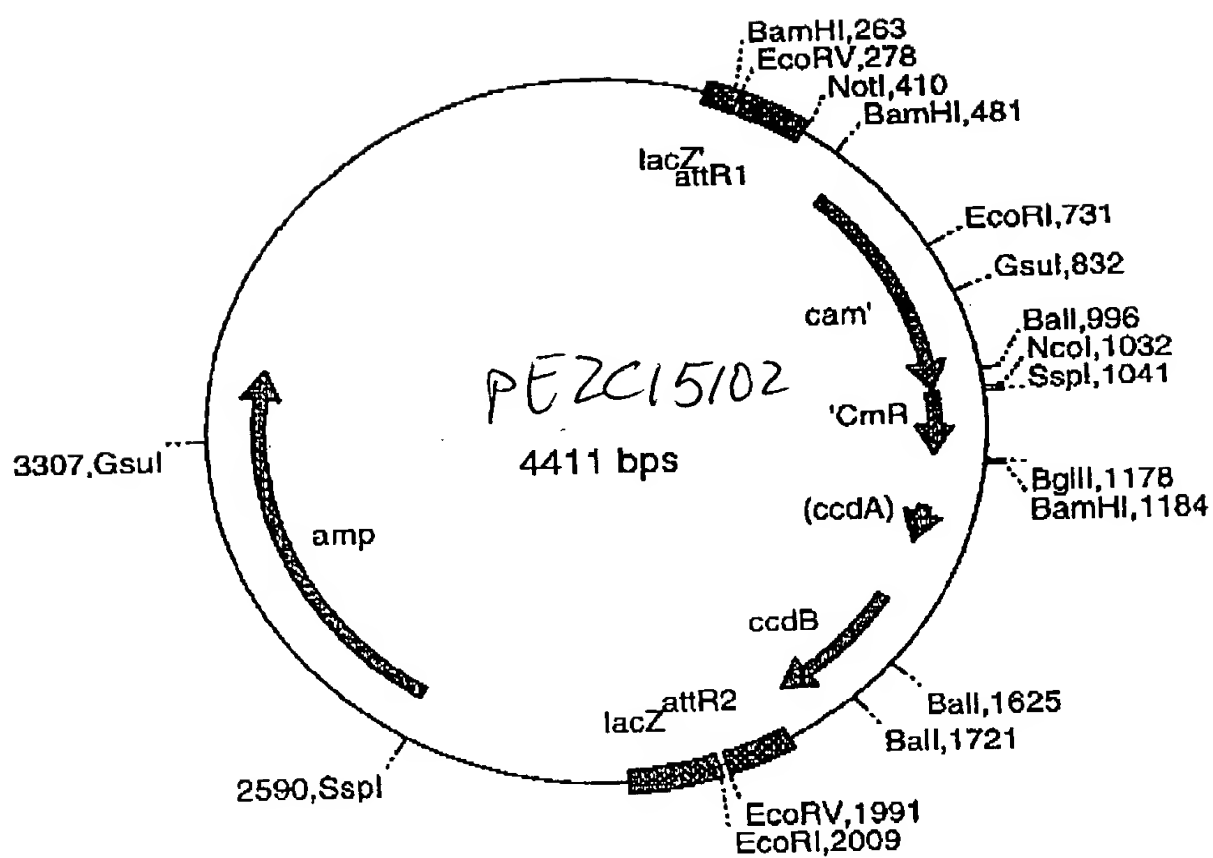
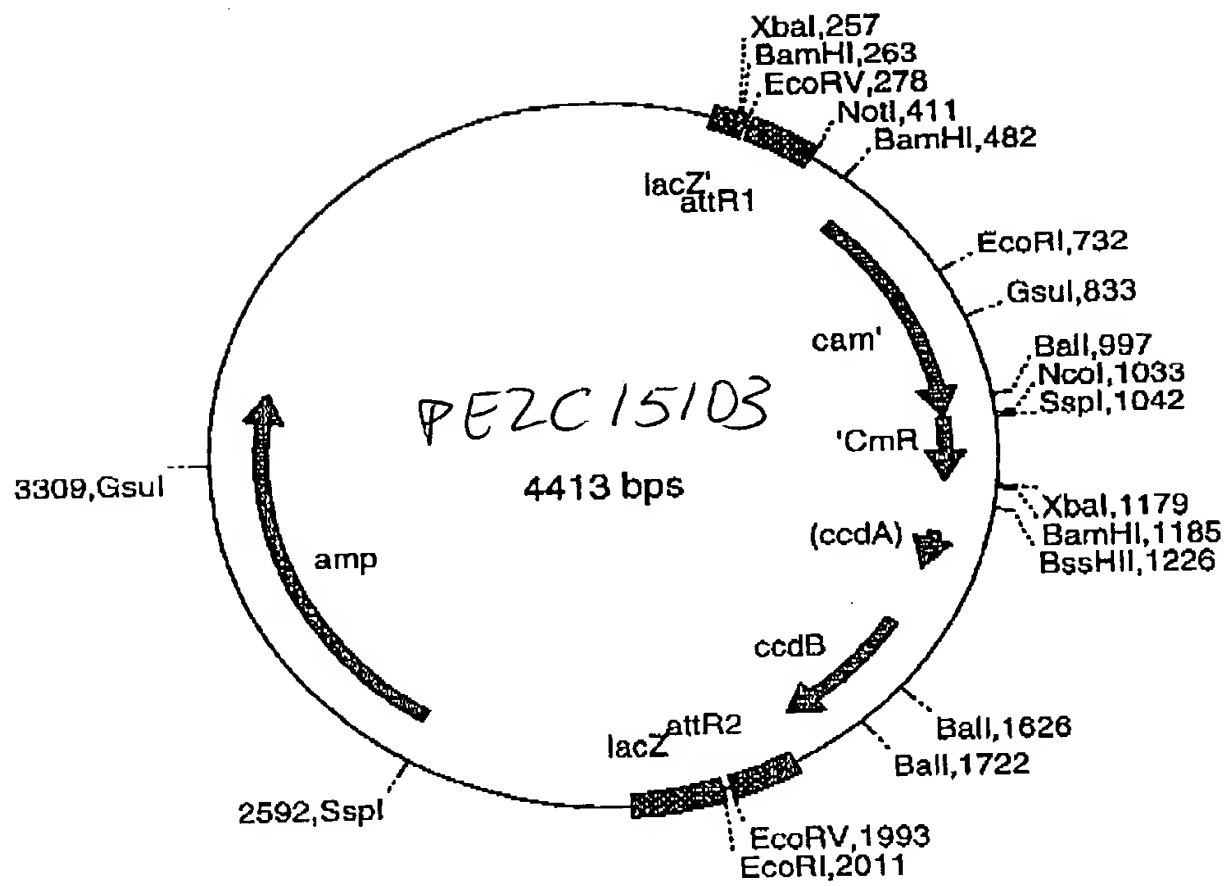
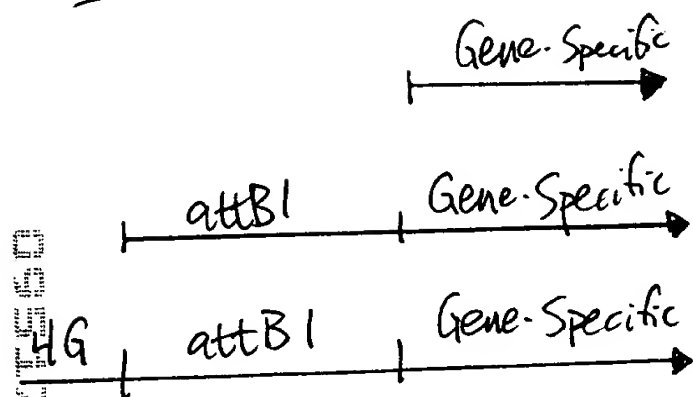


FIGURE 64C



Primers for Amplifying tet^R and amp^R for Cloning by Recombination

Primers



Reverse Primers

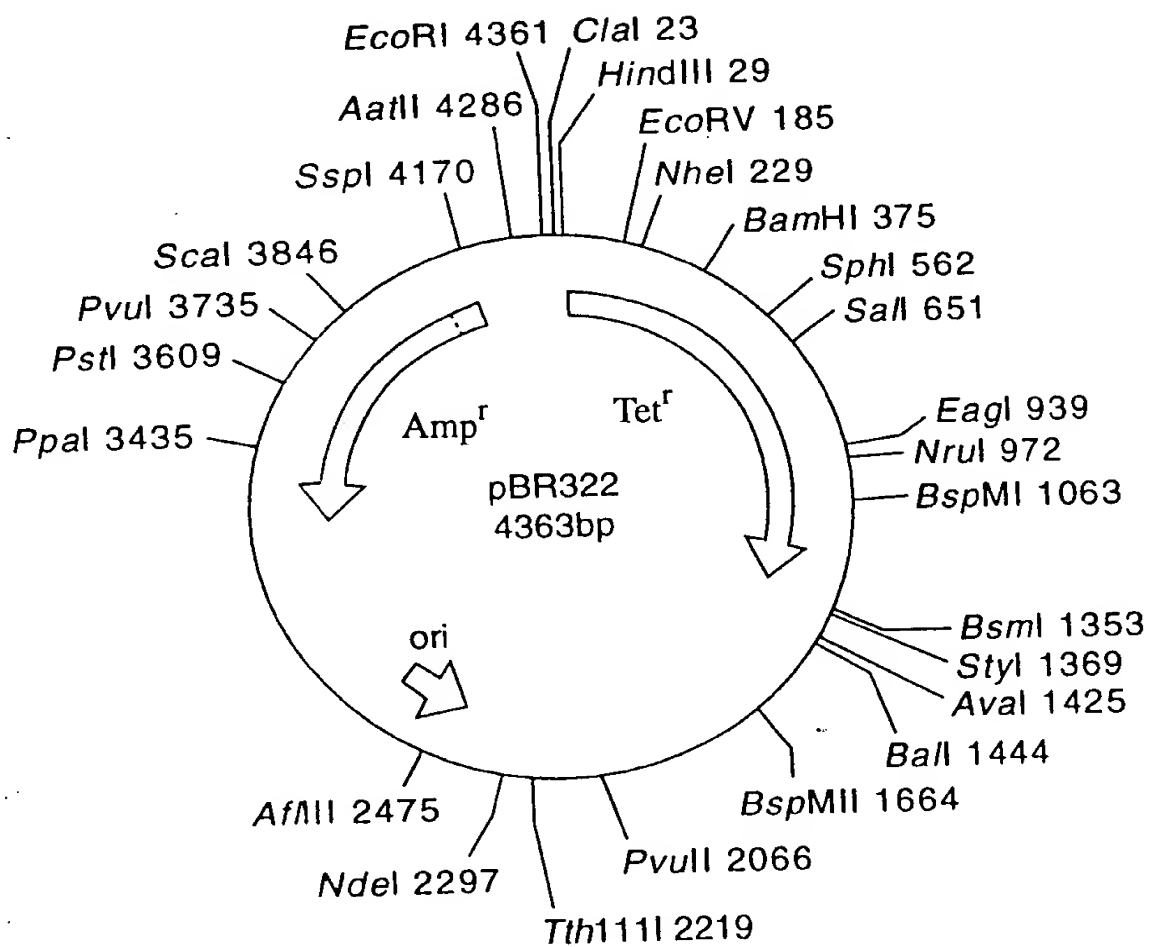
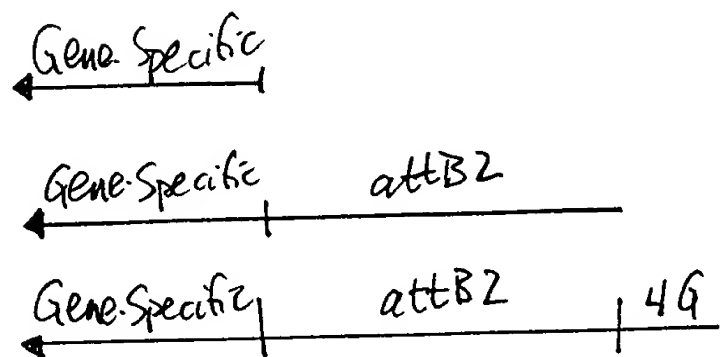


FIGURE 65

Results of Cloning tet and amp PCR Products by Recombination

PCR Product Used in GCS Reactions	No. Colonies Obtained (100 ul plated)	Form of DNA Analyzed	Colonies Obtained of Predicted Size
tet	6, 10	SC	0 of 8
attB-tet	9, 6	SC	1 of 8
attB+4G-tet	824, 1064	SC AvaI+Bam	7 of 7 7 of 7
amp	7, 13	SC	0 of 8
attB-amp	18, 22	SC	3 of 8
attB+4G-amp	3020, 3540	SC PstI	8 of 8 8 of 8
attB Plasmid (Pos. Control)	320, 394		

FIGURE 66

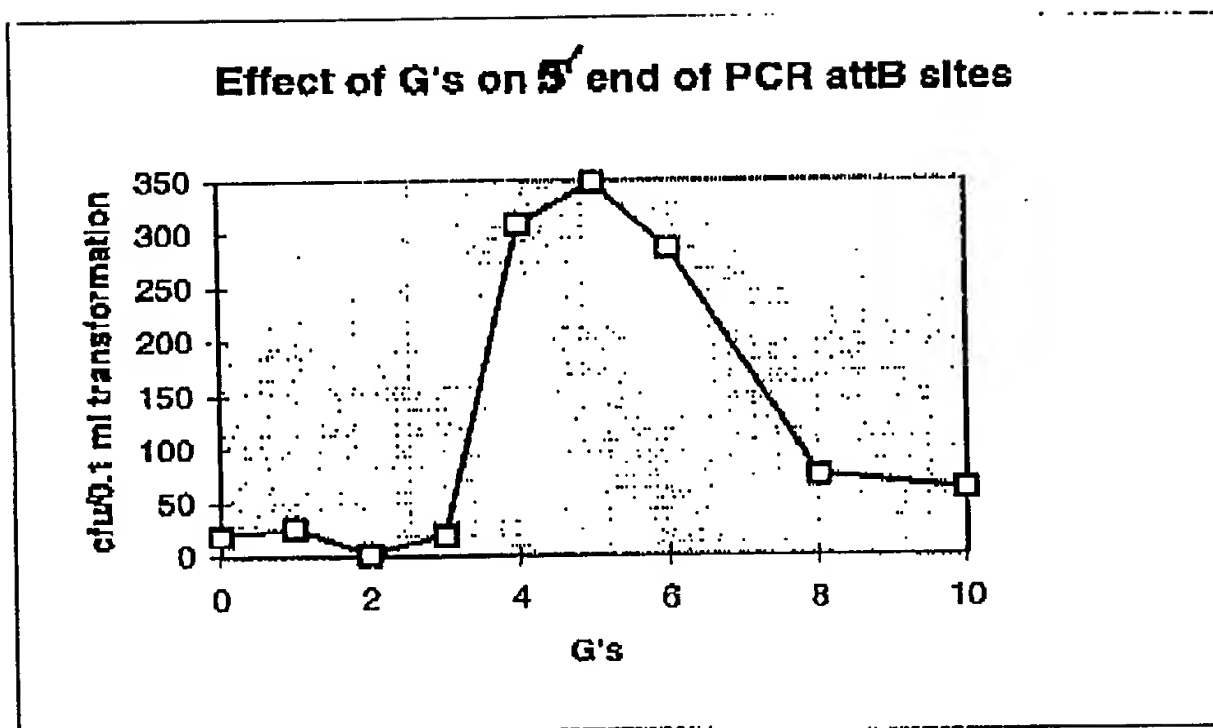
[illegible]

FIGURE 67

Titration of attP amounts with various attB PCR amounts in $B \times P$ Reaction

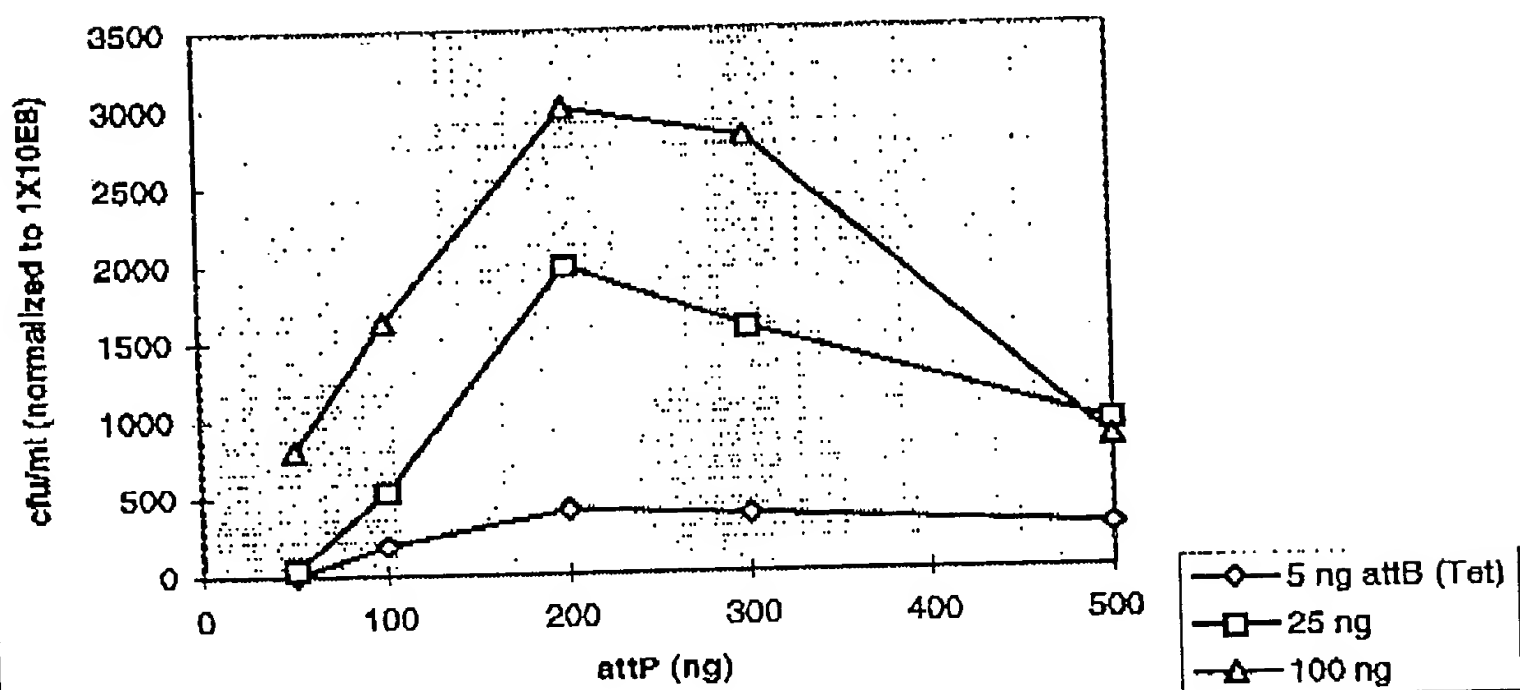
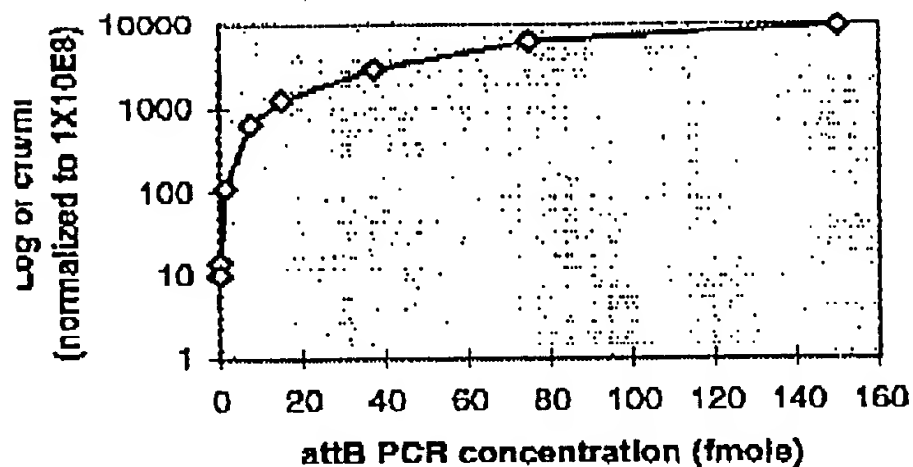


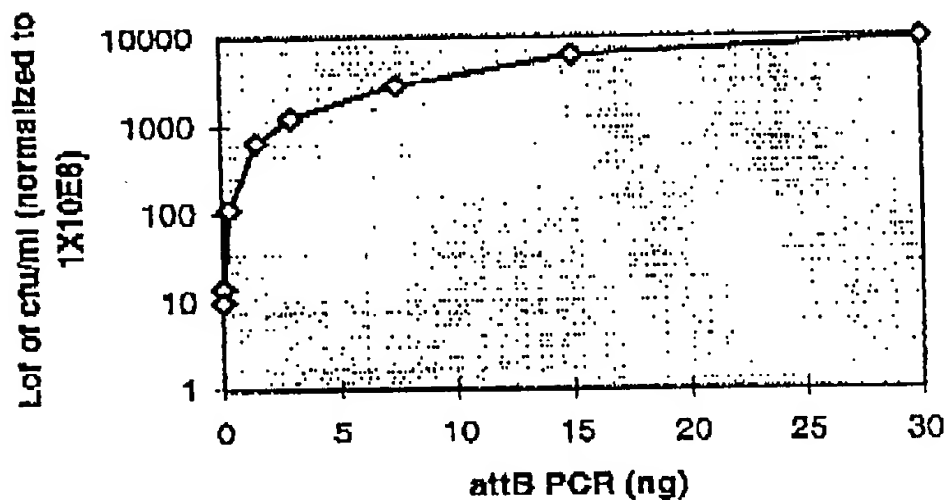
FIGURE 68

FIGURE
69

Titration of 256 bp PCR in Reaction BxP



Titration of 256 bp PCR in Reaction BxP



Efficiency of cloning of 256 bp PCR Into a Destination vector

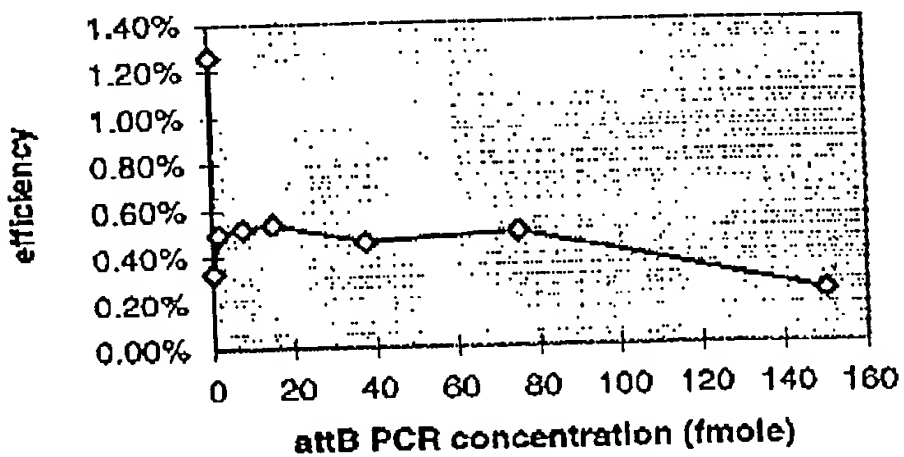
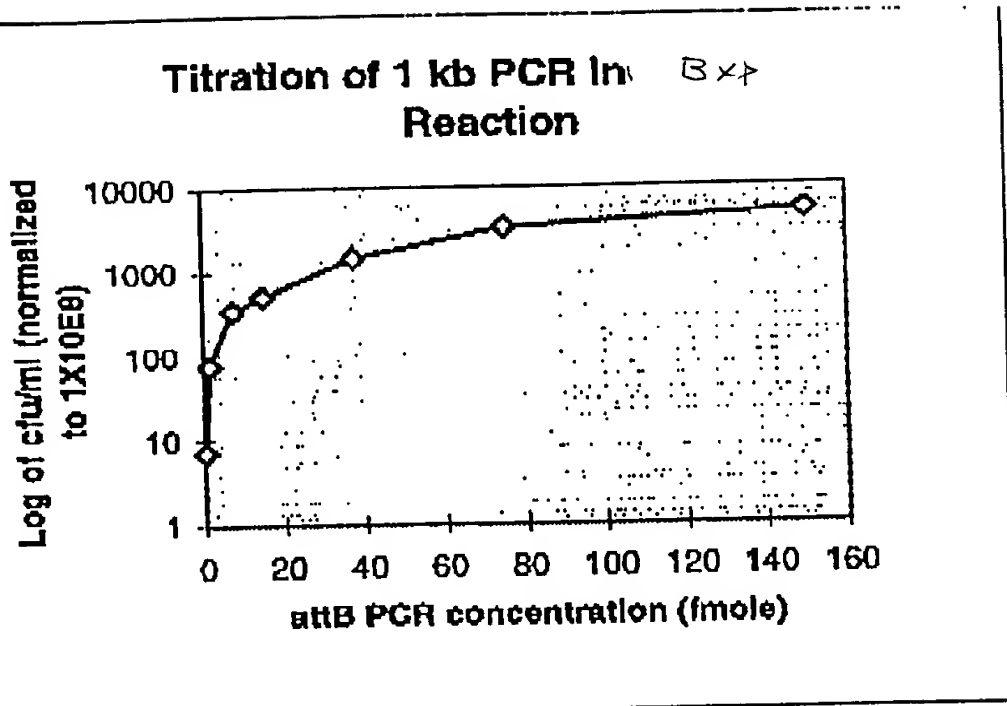
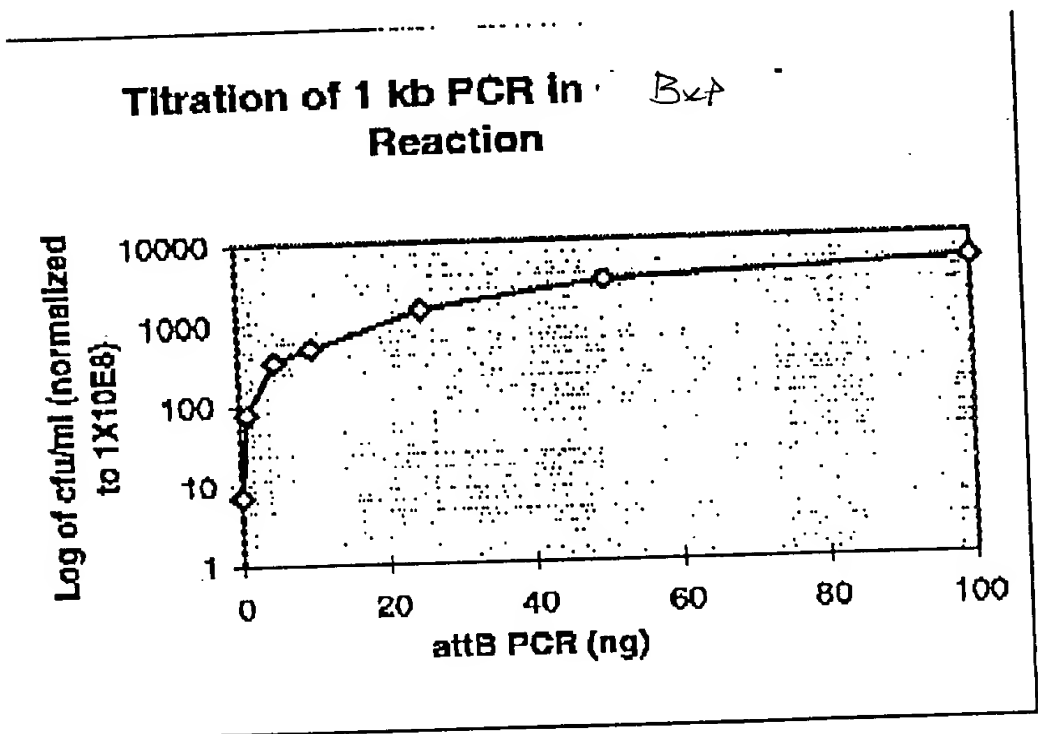


FIGURE
70

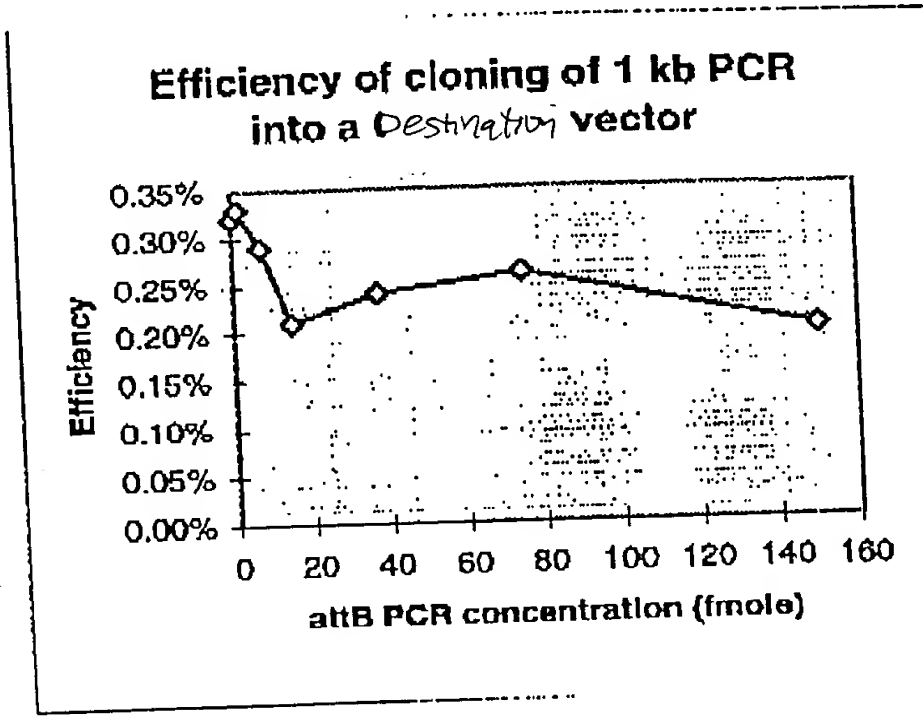
A



B



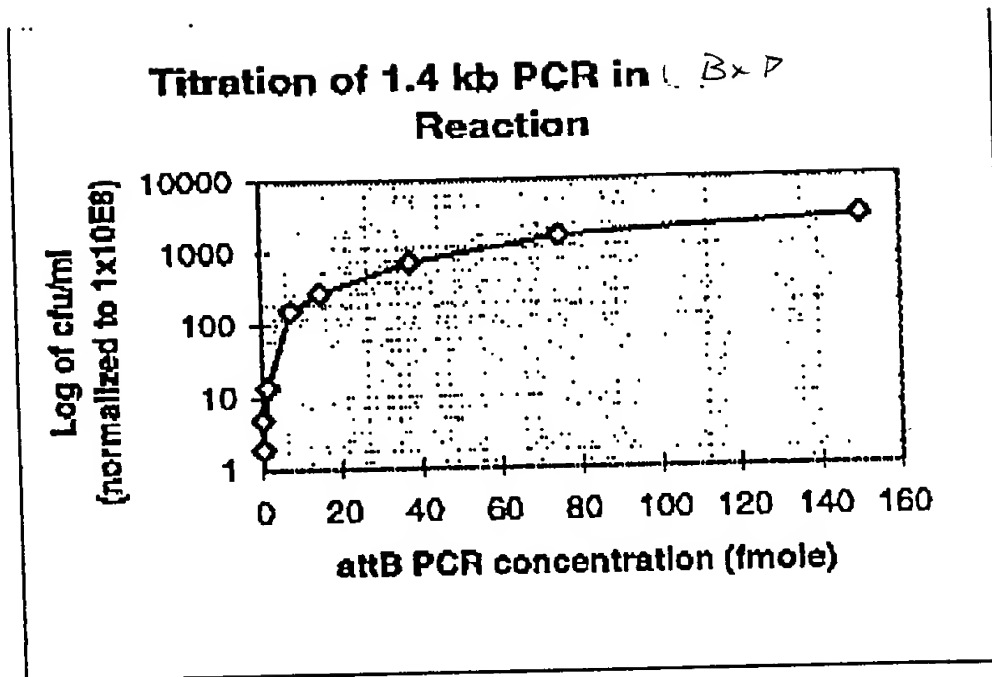
C



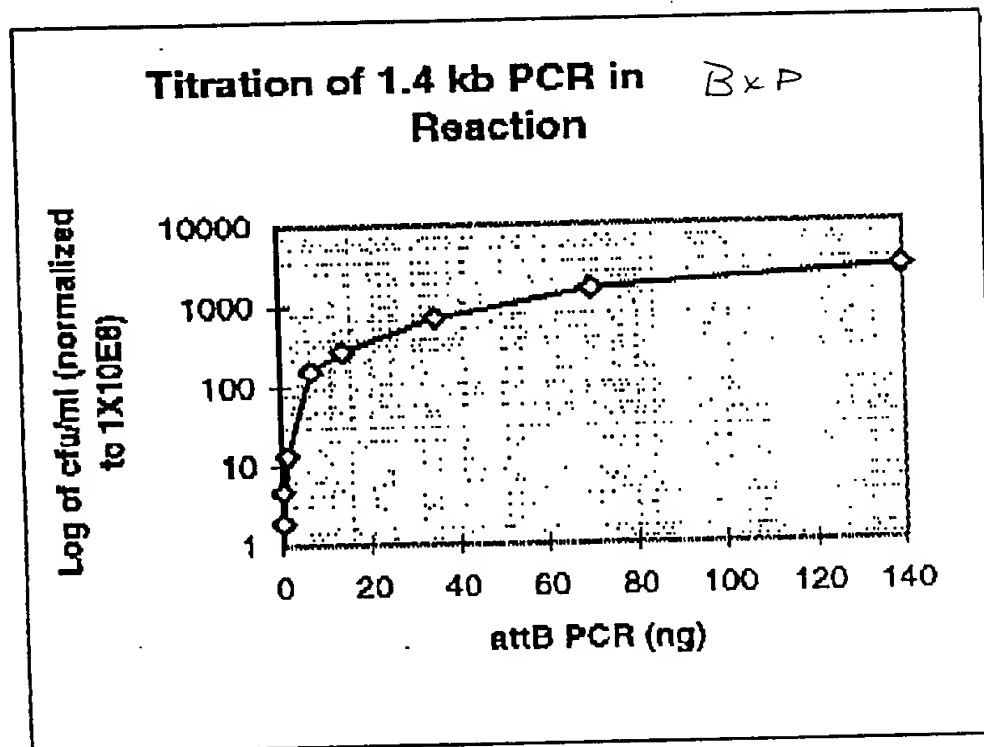
002060" 00447660

FIGURE 71

A



B



C

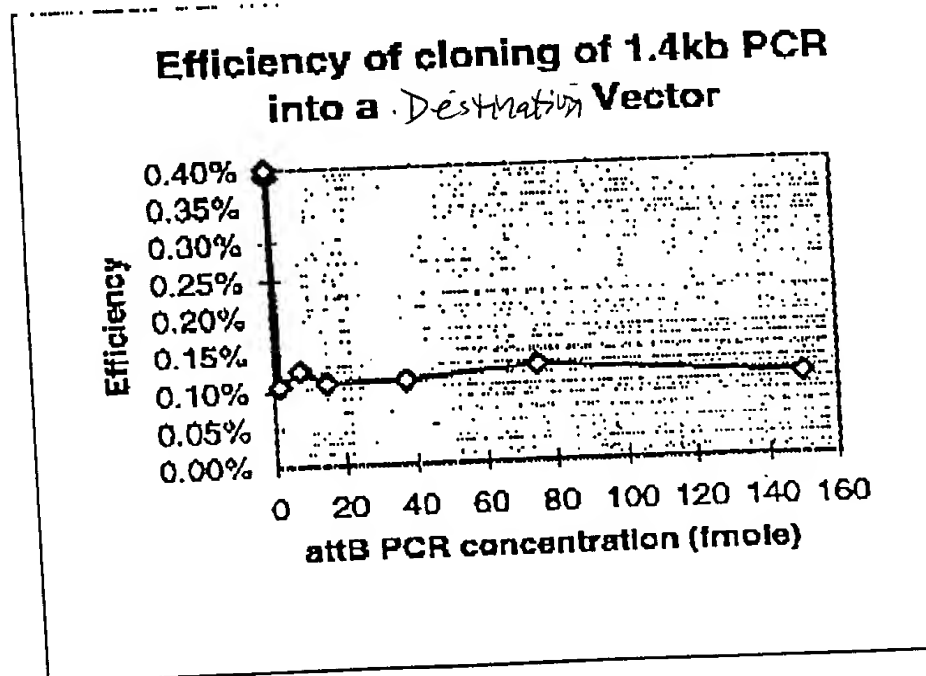
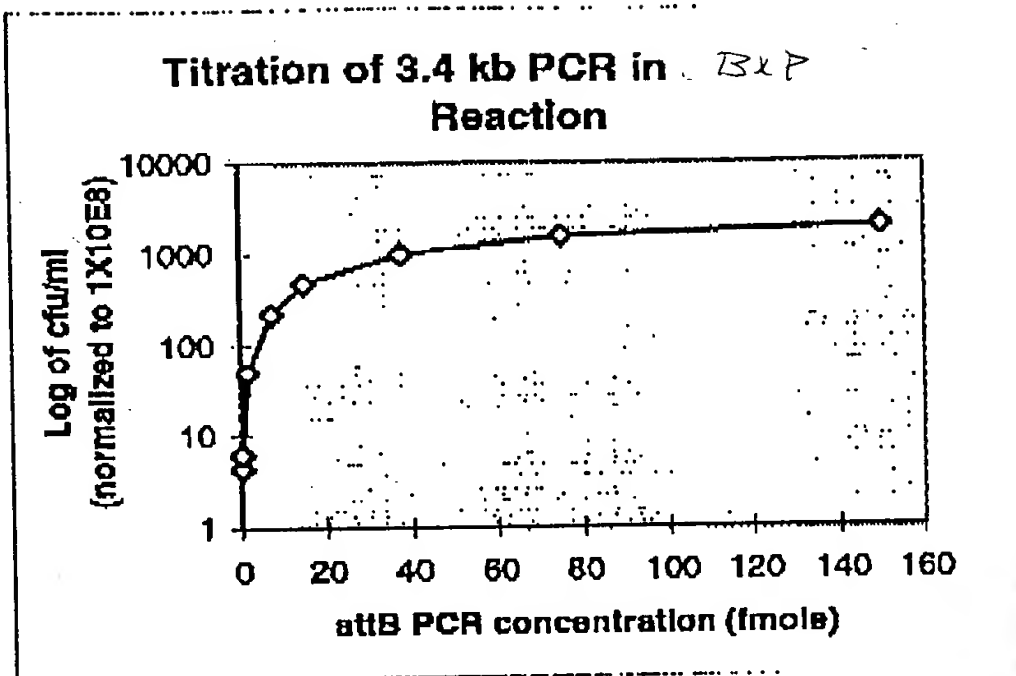
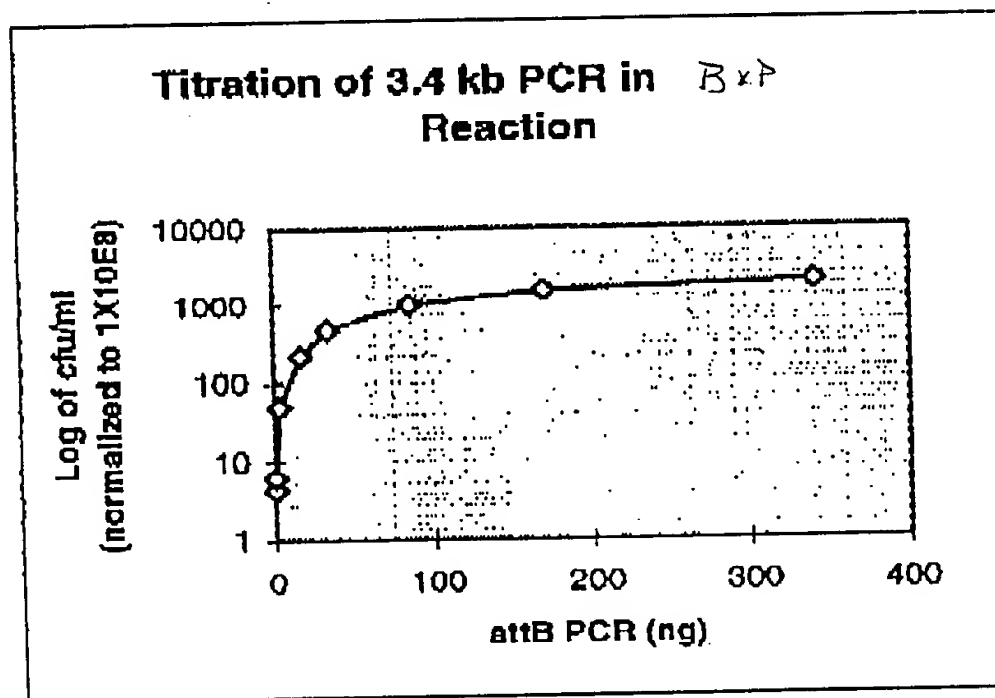


FIGURE 72

A



B



C

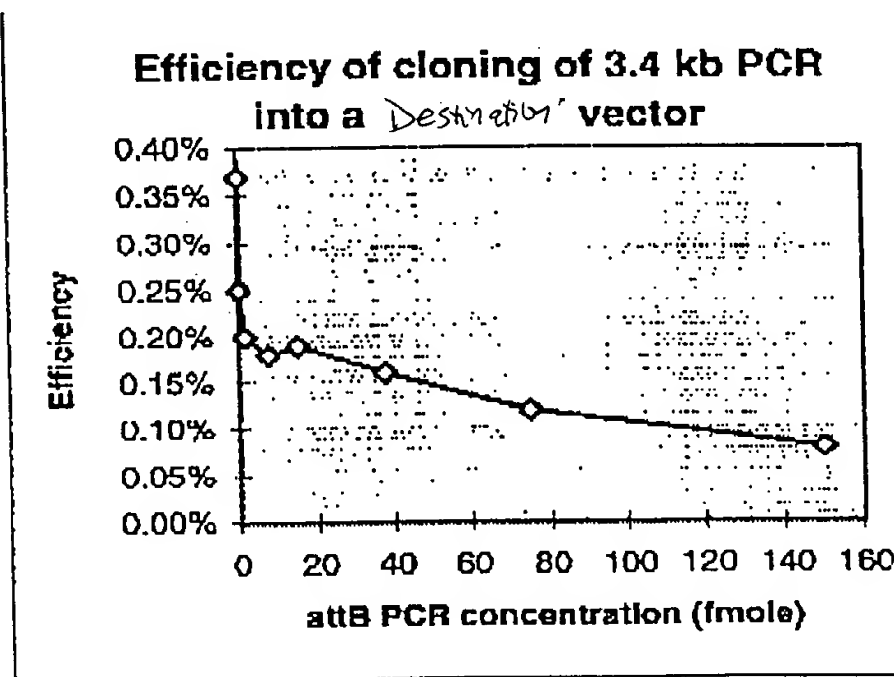
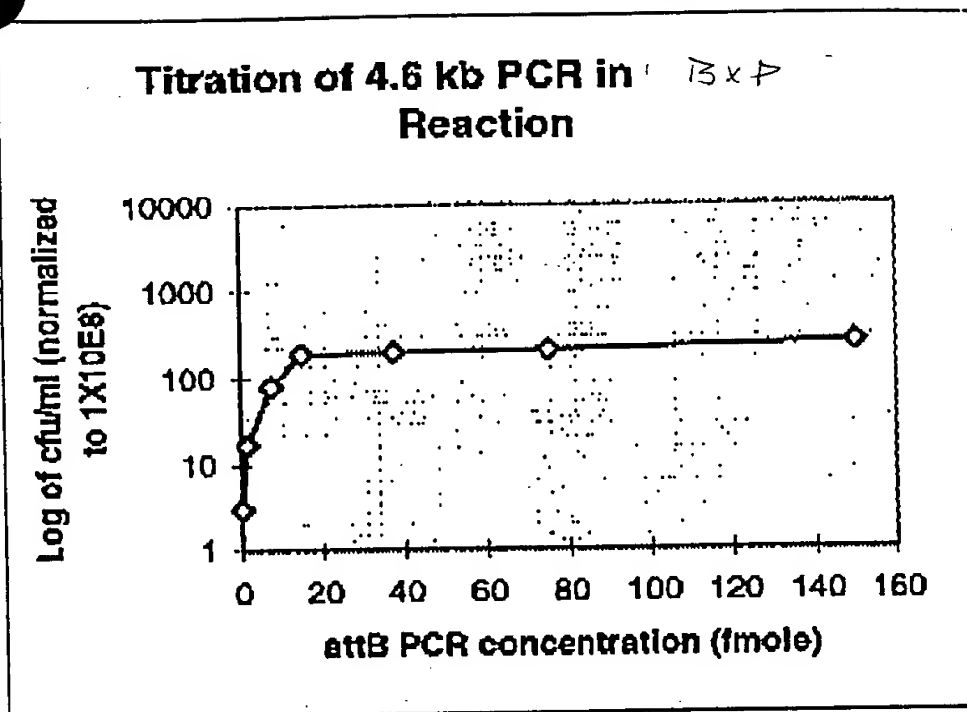
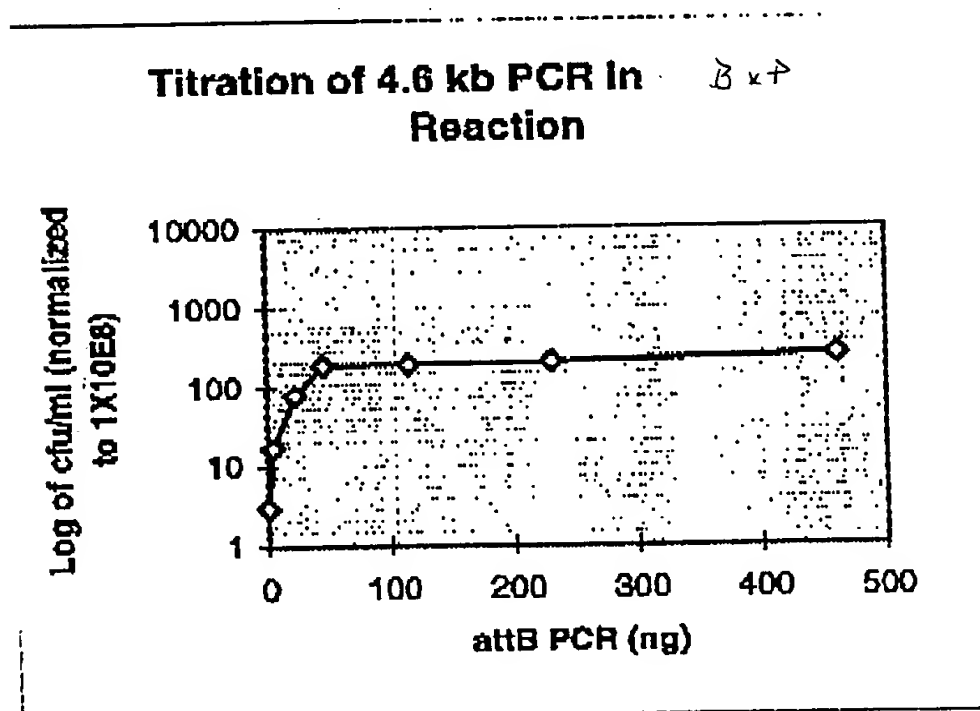


FIGURE 73

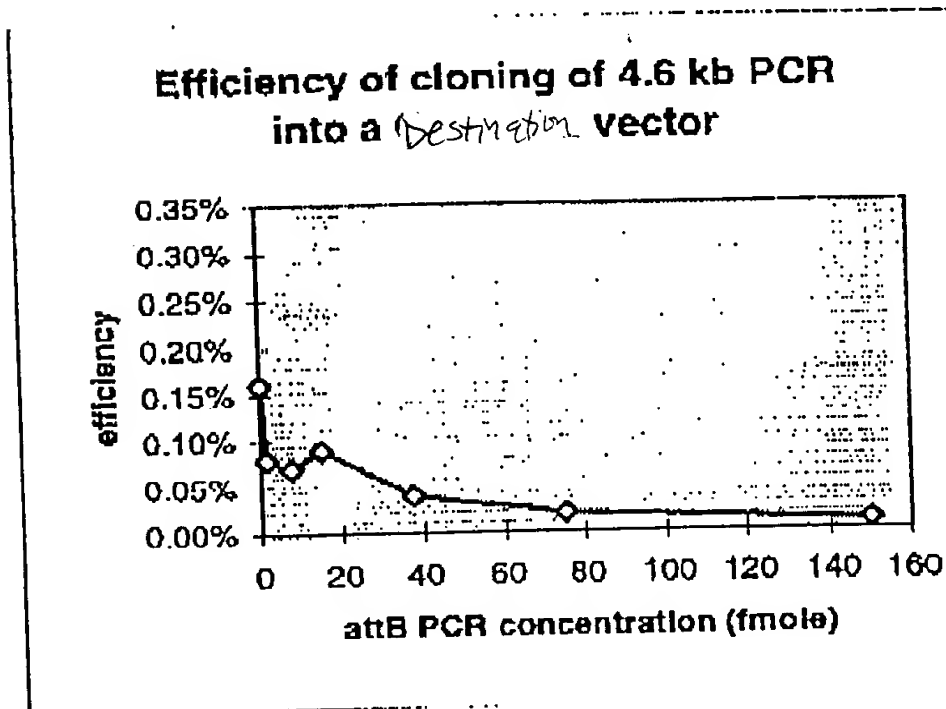
A



B



C



6.9 kb PCR DNA Titration in α BxP Reaction

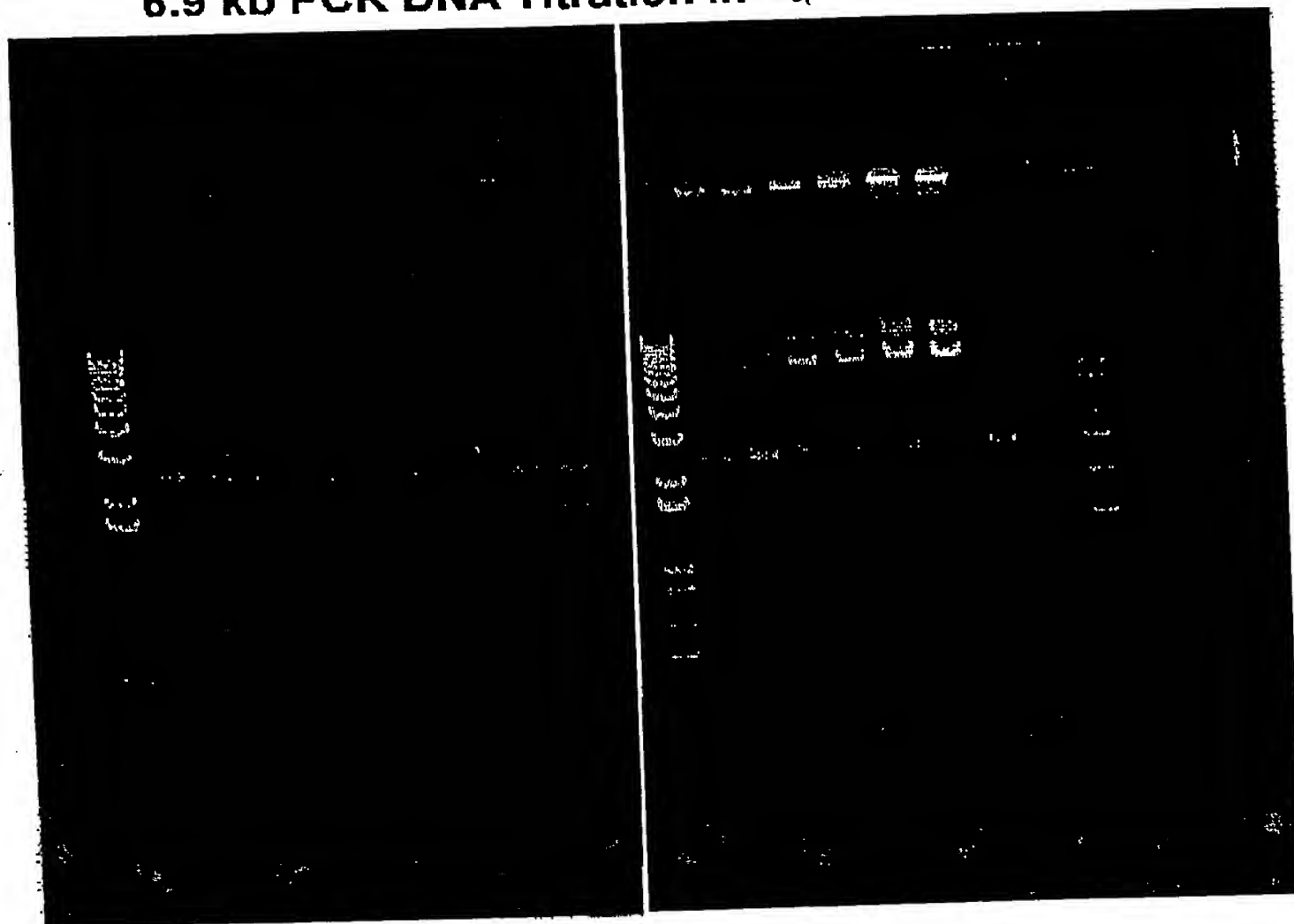


FIGURE 74

Titration of 10.1 kb PCR in *BxP*
Reaction

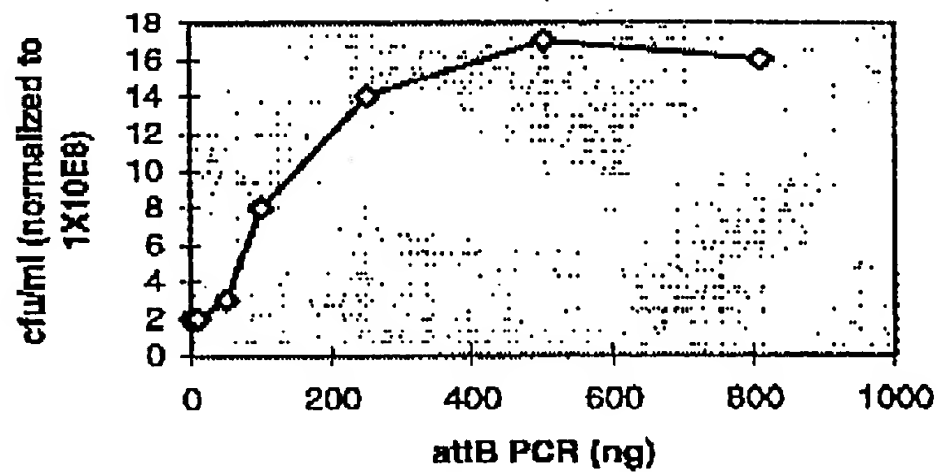


FIGURE 75-

10.1 kb PCR DNA Titration in Bx7 Reaction

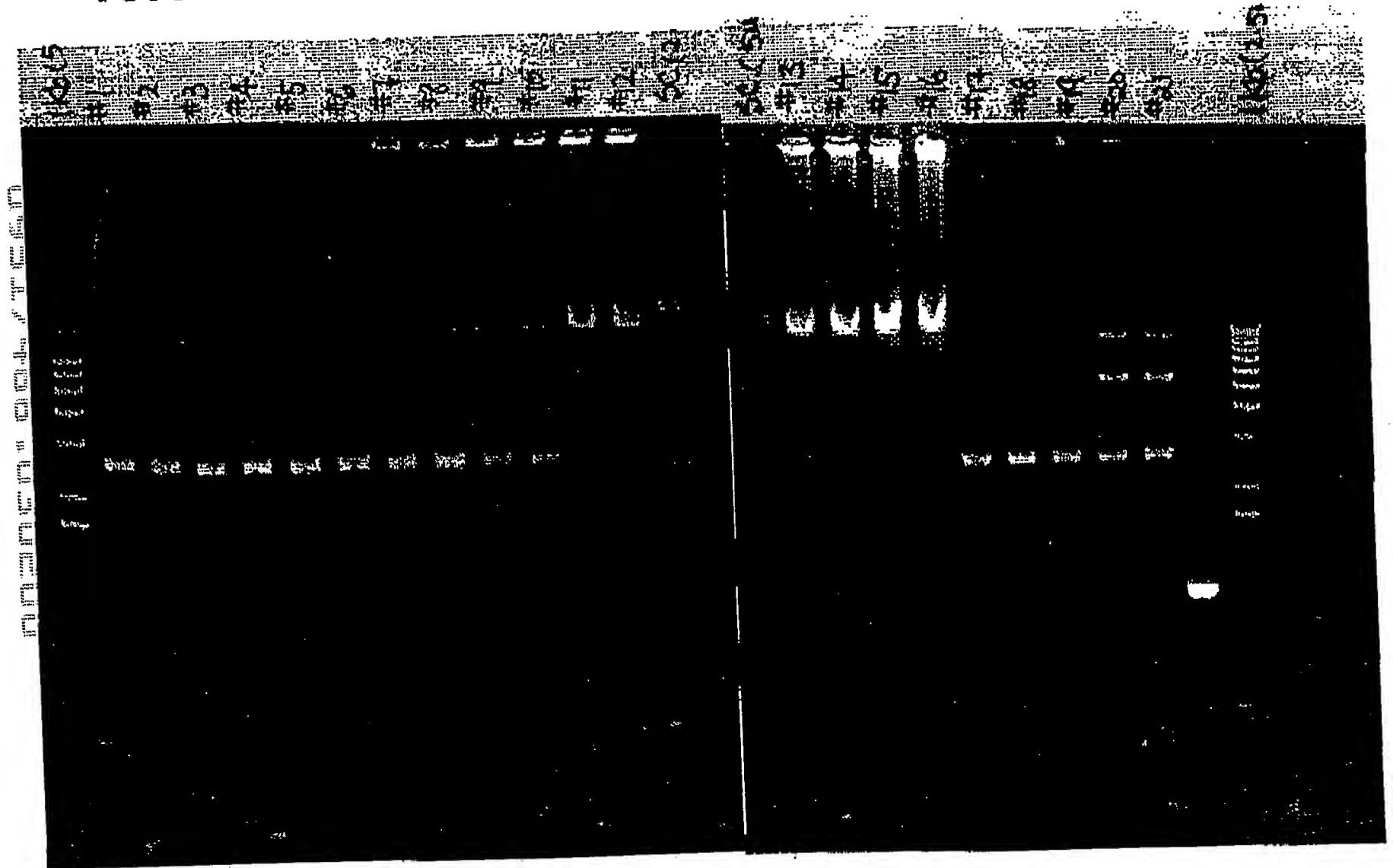


FIGURE 76

Cloning of PCR Products of Different Sizes with the GATEWAY™ PCR Cloning System

Size	fmols PCR DNA	ng PCR DNA	Cols/ml Transformation (pUC=10 ⁸ CFU/ml)	Correct Clones/Total Examined**
0.26 kb*	15	3	1223	10/10 (a)
	37.5	7.5	2815	
1.0 kb	15	10	507	49/50 (b)
	37.5	25	1447	
1.4 kb	15	14	271	48/50 (c)
	37.5	35	683	
3.4 kb	15	34	478	9/10 (a)
	37.5	85	976	
4.6 kb	15	46	190	10/10 (a)
	37.5	115	195	
6.9 kb	15	69	30 (235)**	47/50 (b)
	37.5	173	54 (463)**	

*The 0.26 kb PCR product was used unpurified; all the others were purified by precipitation with PEG/MgCl₂ as described in the text of Example 9, to remove primer dimers potentially present. Standard incubations were for 60 min.

**overnight incubation

- (a) DNA minipreps
- (b) ampR/kanR
- (c) tetR/kanR

Figure 77

Reading frame A:

EcoR V 1/2 site

attR1

ATC ACA AGT TTG TAC AAA AAA
TAG TGT TCA AAC ATG TTT TTT

- [Cm^r - ccdB]

attR2

EcoR V 1/2 site

T TTC TTG TAC AAA GTG GTG AT
A AAG AAC ATG TTT CAC CAC TA

Reading frame B:

attR1

A TCA ACA AGT TTG TAC AAA AAA
T AGT TGT TCA AAC ATG TTT TTT

- [Cm^r - ccdB]

attR2

T TTC TTG TAC AAA GTG GTT GAT
A AAG AAC ATG TTT CAC CAA CTA

Reading frame C: (Alternative)

attR1

AT CAA ACA AGT TTG TAC AAA AAA
TA GTT TGT TCA AAC ATG TTT TTT

- [Cm^r - ccdB]

attR2

T TTC TTG TAC AAA GTG GTT CGA T
A AAG AAC ATG TTT CAC CAA GCT A

att R1

AT CAA ACA AGT TTT TAC AAA AAT
TA GTT TGT TCA AAC ATG TTT ATT

- [CmR-ccdB] -

att R2

T TTC TTG TAC AAA GTG GTT TGA
A AAG AAC ATG TTT CAC CAA ACT

FIGURE 78

Fusion protein
codon

Reading frame A cassette

```

--- nnn nnn atc aca agt ttg tac aaa aaa gct ---
--- nnn nnn tag tgt tca aac atg ttt ttt cga ---

```

attR 1

Reading frame B cassette

```

--- nnn nnn nna tca aca agt ttg tac aaa aaa gct ---
--- nnn nnn nnt agt tgt tca aac atg ttt ttt cga ---

```

* cannot be TG or TA

Reading frame C cassette

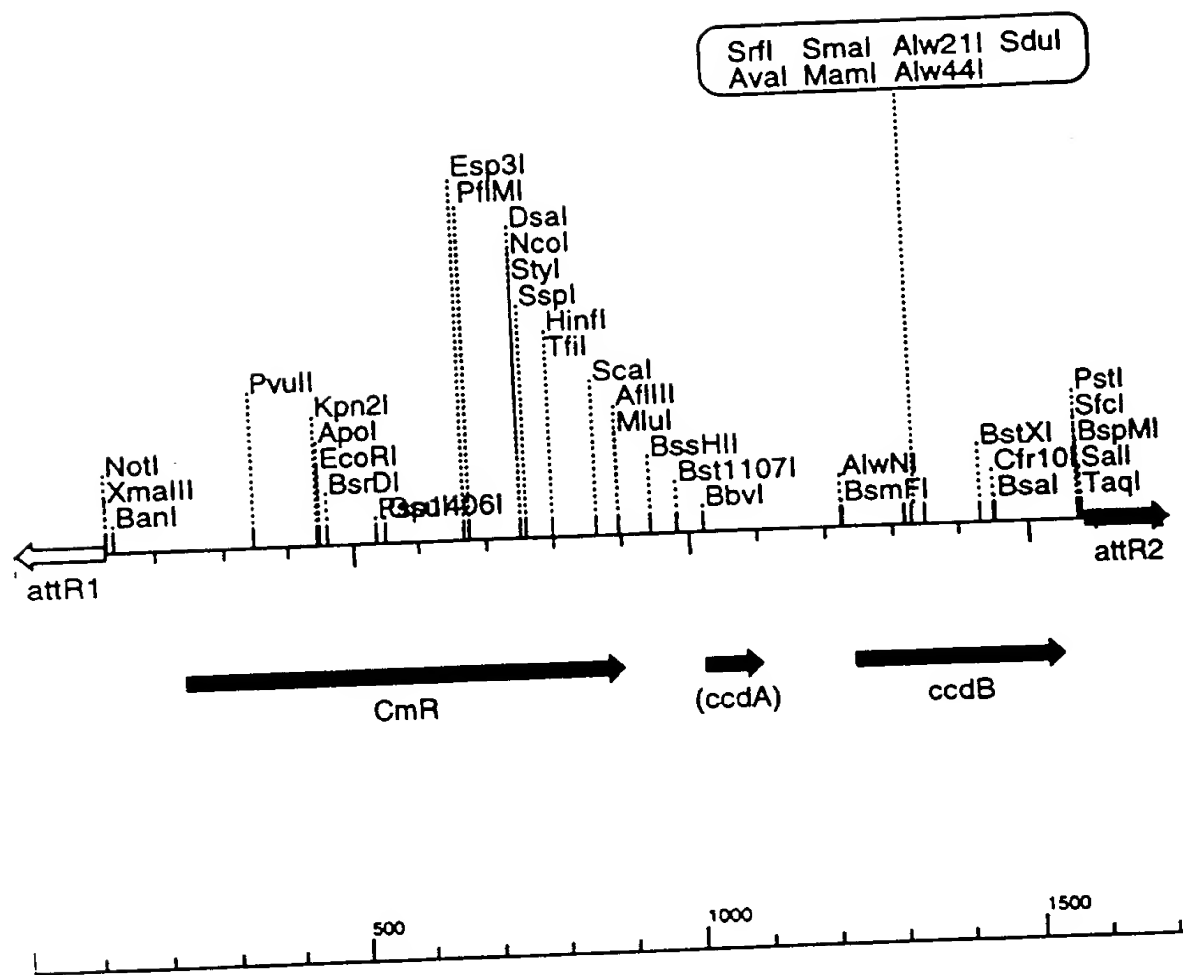
```

--- nnn nnn nat caa aca agt ttg tac aaa aaa gct ---
--- nnn nnn nta gtt tgt tca aac atg ttt ttt cga ---

```

FIGURE 79

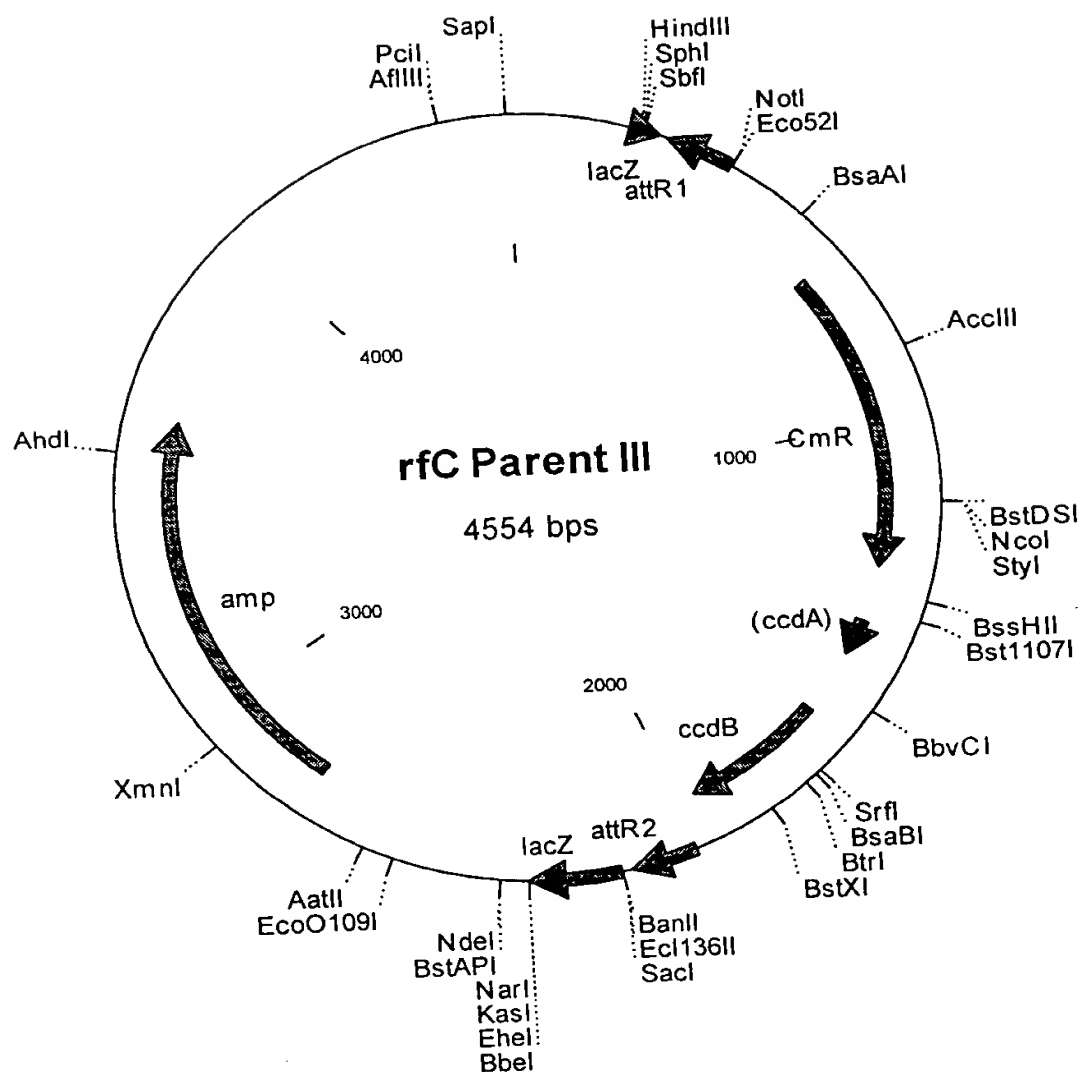
003060-04760



rfa Cassette (1711 bps)

FIGURE 80

FIGURE 83 A



prfC Parent III 4554 bp

Location (Base Nos.)	Gene Encoded
410..286	attR1
660..1319	CmR
1439..1523	inactivated ccdA
1661..1966	ccdB
2007..2131	attR2
2753..3613	amp

```

1 GCGCCCAATA CGCAAACCGC CTCTCCCCGC GCGTTGGCCG ATTCATTAAT GCAGCTGGCA
61 CGACAGGTTT CCCGACTGGA AAGCGGGCAG TGAGCGCAAC GCAATTAATG TGAGTTAGCT
121 CACTCATTAG GCACCCCAGG CTTTACACTT TATGCTTCCG GCTCGTATGT TGTGTGGAAT
181 TGTGAGCGGA TAACAATTTC ACACAGGAAA CAGCTATGAC CATGATTACG CCAAGCTTGC
241 ATGCCTGCAG GTCGACTCTA GAGGATCCCC GGGTACCGAT ATCAAACAAG TTTGTACAAA
301 AAAGCTGAAC GAGAAACGTA AAATGATATA AATATCAATA TATTAAATTA GATTTTGCAT
361 AAAAAACAGA CTACATAATA CTGTAAAACA CAACATATCC AGTCACTATG GCGGCCGCTA
421 AGTTGGCAGC ATCACCCGAC GCACTTTGCG CCGAATAAAT ACCTGTGACG GAAGATCACT
481 TCGCAGAATA AATAAATCCT GGTGTCCCTG TTGATACCGG GAAGCCCTGG GCCAACTTTT
541 GGCGAAAATG AGACGTTGAT CGGCACGTAA GAGGTTCCAA CTTTCACCAT AATGAAATAA
601 GATCACTACC GGGCGTATTT TTTGAGTTAT CGAGATTTTC AGGAGCTAAG GAAGCTAAAA
661 TGGAGAAAAA AATCACTGGA TATACCACCG TTGATATATC CCAATGGCAT CGTAAAGAAC
721 ATTTTGAGGC ATTTCACTCA GTTGCTCAAT GTACCTATAA CCAGACCGTT CAGCTGGATA
781 TTACGGCCTT TTTAAAGACC GTAAAGAAAA ATAAGCACAA GTTTTATCCG GCCTTTATTC
841 ACATTCTTGC CCGCCTGATG AATGCTCATC CGGAATTCCG TATGGCAATG AAAGACGGTG
901 AGCTGGTGAT ATGGGATAGT GTTACCCCTT GTTACACCGT TTTCCATGAG CAAACTGAAA
961 CGTTTTTCATC GCTCTGGAGT GAATACCACG ACGATTTCCG GCAGTTTCTA CACATATATT
1021 CGCAAGATGT GGCCTGTTAC GGTGAAAACC TGGCCTATTT CCCTAAAGGG TTTATTGAGA
1081 ATATGTTTTT CGTCTCAGCC AATCCCTGGG TGAGTTTCAC CAGTTTTGAT TTAAACGTGG
1141 CCAATATGGA CAACTTCTTC GCCCCGTTT TCACCATGGG CAAATATTAT ACGCAAGGCG
1201 ACAAGGTGCT GATGCCGCTG GCGATTGAGG TTCATCATGC CGTCTGTGAT GGCTTCCATG
1261 TCGGCAGAAT GCTTAATGAA TTACAACAGT ACTGCGATGA GTGGCAGGGC GGGGCGTAAT
1321 CTAGAGGATC CGGCTTACTA AAAGCCAGAT AACAGTATGC GTATTTGCGC GCTGATTTTT
1381 GCGGTATAAG AATATATACT GATATGTATA CCCGAAGTAT GTCAAAAAGA GGTGTGCTAT
1441 GAAGCAGCGT ATTACAGTGA CAGTTGACAG CGACAGCTAT CAGTTGCTCA AGGCATATAT
1501 GATGTCAATA TCTCCGGTCT GGTAAGCACA ACCATGCAGA ATGAAGCCCG TCGTCTGCGT
1561 GCCGAACGCT GGAAAGCGGA AAATCAGGAA GGGATGGCTG AGGTCGCCCC GTTTATTGAA
1621 ATGAACGGCT CTTTTGCTGA CGAGAACAGG GACTGGTGAA ATGCAGTTTA AGGTTTACAC
1681 CTATAAAAGA GAGAGCCGTT ATCGTCTGTT TGTGGATGTA CAGAGTGATA TTATTGACAC
1741 GCCCCGGCGA CGGATGGTGA TCCCCCTGGC CAGTGCACGT CTGCTGTCAG ATAAAGTCTC
1801 CCGTGAACCT TACCCGGTGG TGCATATCGG GGATGAAAGC TGGCGCATGA TGACCACCGA
1861 TATGGCCAGT GTGCCGGTCT CCGTTATCGG GGAAGAAGTG GCTGATCTCA GCCACCGCGA
1921 AAATGACATC AAAAACGCCA TTAACCTGAT GTTCTGGGGA ATATAAATGT CAGGCTCCGT
1981 TATACACAGC CAGTCTGCAG GTCGACCATA GTGACTGGAT ATGTTGTGTT TTACAGTATT
2041 ATGTAGTCTG TTTTTTATGC AAAATCTAAT TTAATATATT GATATTTATA TCATTTTACG
2101 TTTCTCGTTC AGCTTTCTTG TACAAAGTGG TTCGATATCG GTACCGAGCT CGAATTCATC
2161 GGCCGTCGTT TTACAACGTC GTGACTGGGA AAACCTTGGC GTTACCCAAC TTAATCGCCT
2221 TGCAGCACAT CCCCCTTTCG CCAGCTGGCG TAATAGCGAA GAGGCCCGCA CCGATCGCCC
2281 TTCCCAACAG TTGCGCAGCC TGAATGGCGA ATGGCGCCTG ATGCGGTATT TTCTCCTTAC
2341 GCATCTGTGC GGTATTTTAC ACCGCATATG GTGCACTCTC AGTACAATCT GCTCTGATGC
2401 CGCATAGTTA AGCCAGCCCC GACACCCGCC AACACCCGCT GACGCGCCCT GACGGGCTTG
2461 TCTGCTCCCG GCATCCGCTT ACAGACAAGC TGTGACCGTC TCCGGGAGCT GCATGTGTCA
2521 GAGGTTTTTCA CCGTCATCAC CGAAACGCGC GAGACGAAAG GGCCTCGTGA TACGCCTATT
2581 TTTATAGGTT AATGTCATGA TAATAATGGT TTCTTAGACG TCAGGTGGCA CTTTTCGGGG
2641 AAATGTGCGC GGAACCCCTA TTTGTTTATT TTTCTAAATA CATTCAAATA TGTATCCGCT
2701 CATGAGACAA TAACCCTGAT AAATGCTTCA ATAATATTGA AAAAGGAAGA GTATGAGTAT
2761 TCAACATTTT CGTGTGCGCC TTATTCCCTT TTTTGC GGCA TTTTGCCTTC CTGTTTTTGC -

```

FIGURE 83B

2821 TCACCCAGAA ACGCTGGTGA AAGTAAAAGA TGCTGAAGAT CAGTTGGGTG CACGAGTGGG
 2881 TTACATCGAA CTGGATCTCA ACAGCGGTAA GATCCTTGAG AGTTTTTCGCC CCGAAGAACG
 2941 TTTTCCAATG ATGAGCACTT TTAAAGTTCT GCTATGTGGC GCGGTATTAT CCCGTATTGA
 3001 CGCCGGGCAA GAGCAACTCG GTCGCCGCAT ACACTATTCT CAGAATGACT TGGTTGAGTA
 3061 CTCACCAGTC ACAGAAAAGC ATCTTACGGA TGGCATGACA GTAAGAGAAT TATGCAGTGC
 3121 TGCCATAACC ATGAGTGATA ACACTGCGGC CAACTTACTT CTGACAACGA TCGGAGGACC
 3181 GAAGGAGCTA ACCGCTTTTT TGCACAACAT GGGGGATCAT GTAACTCGCC TTGATCGTTG
 3241 GGAACCGGAG CTGAATGAAG CCATACCAAA CGACGAGCGT GACACCACGA TGCCTGTAGC
 3301 AATGGCAACA ACGTTGCGCA AACTATTAAC TGGCGAATA CTTACTCTAG CTTCCCGGCA
 3361 ACAATTAATA GACTGGATGG AGGCGGATAA AGTTGCAGGA CCACTTCTGC GCTCGGCCCT
 3421 TCCGGCTGGC TGGTTTATTG CTGATAAATC TGGAGCCGGT GAGCGTGGGT CTCGCGGTAT
 3481 CATTGCAGCA CTGGGGCCAG ATGGTAAGCC CTCCCGTATC GTAGTTATCT ACACGACGGG
 3541 GAGTCAGGCA ACTATGGATG AACGAAATAG ACAGATCGCT GAGATAGGTG CCTCACTGAT
 3601 TAAGCATTGG TAACTGTCAG ACCAAGTTTA CTCATATATA CTTTAGATTG ATTTAAACT
 3661 TCATTTTTAA TTTAAAAGGA TCTAGGTGAA GATCCTTTTT GATAATCTCA TGACCAAAT
 3721 CCCTTAACGT GAGTTTTTCGT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC
 3781 TTCTTGAGAT CCTTTTTTTC TGC GCGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT
 3841 ACCAGCGGTG GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAAGTGG
 3901 CTTCAAGAAC TCTGTAGCAC CGCCTACATA CCTCGCTCTG CTAATCCTGT TACCAAGTGGC
 3961 CTTCAAGAAC TCTGTAGCAC CGCCTACATA CCTCGCTCTG CTAATCCTGT TACCAAGTGGC
 4021 TGCTGCCAGT GGCGATAAGT CGTGTCTTAC CGGGTTGGAC TCAAGACGAT AGTTACCGGA
 4081 TAAGGCGCAG CGGTCGGGCT GAACGGGGGG TTCGTGCACA CAGCCAGCT TGGAGCGAAC
 4141 GACCTACACC GAACTGAGAT ACCTACAGCG TGAGCTATGA GAAAGCGCCA CGCTTCCCGA
 4201 AGGGAGAAAG GCGGACAGGT ATCCGGTAAG CGGCAGGGTC GGAACAGGAG AGCGCACGAG
 4261 GGAGCTTCCA GGGGGAAACG CCTGGTATCT TTATAGTCCT GTCGGGTTTC GCCACCTCTG
 4321 ACTTGAGCGT CGATTTTTGT GATGCTCGTC AGGGGGGCGG AGCCTATGGA AAAACGCCAG
 4381 CAACGCGGCC TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTTCTTTCC
 4441 TCGGTTATCC CCTGATTCTG TGGATAACCG TATTACCGCC TTTGAGTGAG CTGATACCGC
 4501 TCGCCGCAGC CGAACGACCG AGCGCAGCGA GTCAGTGAGC GAGGAAGCGG AAGA

FIGURE 83C

003030 00447550

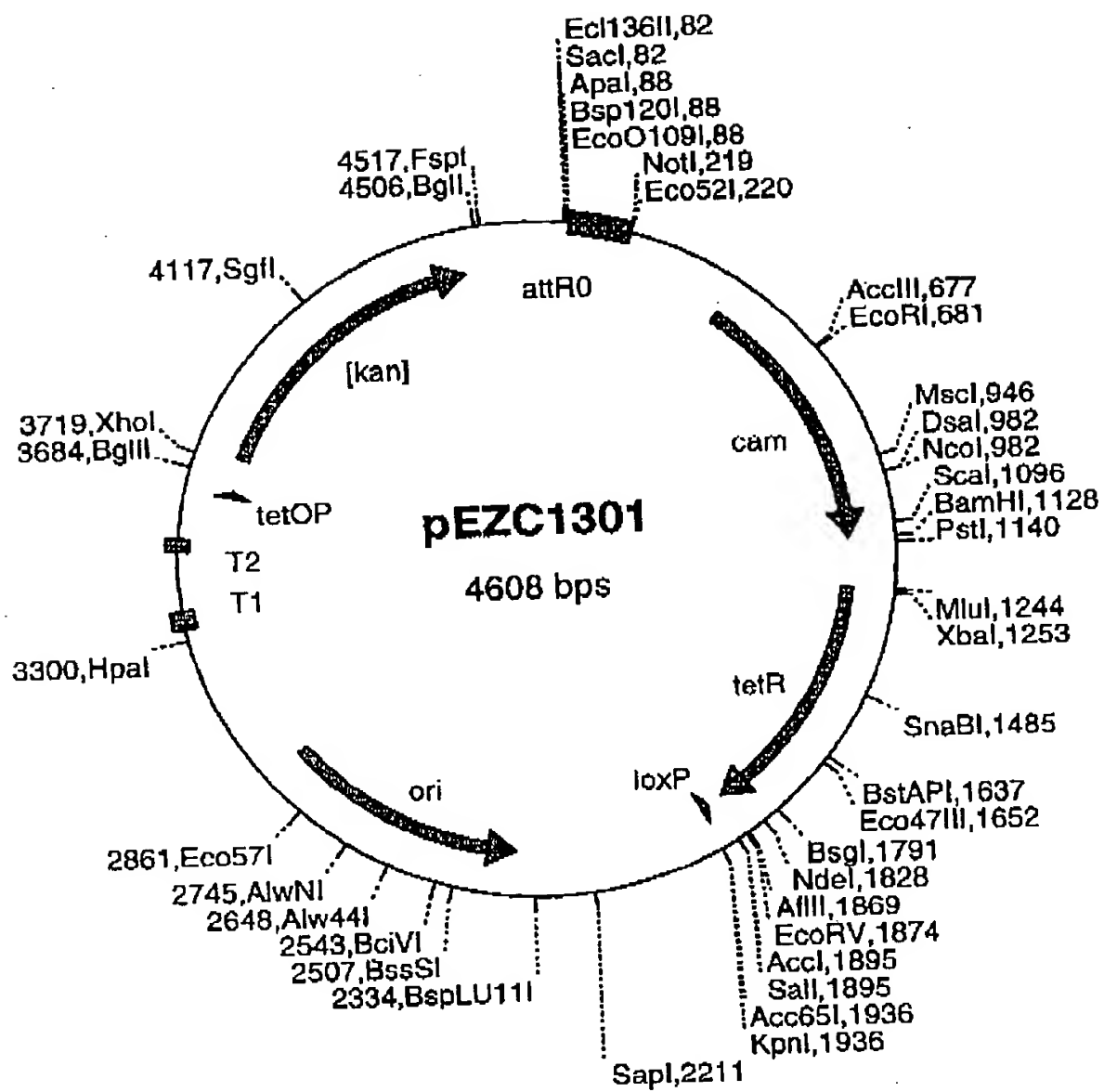


FIGURE 84

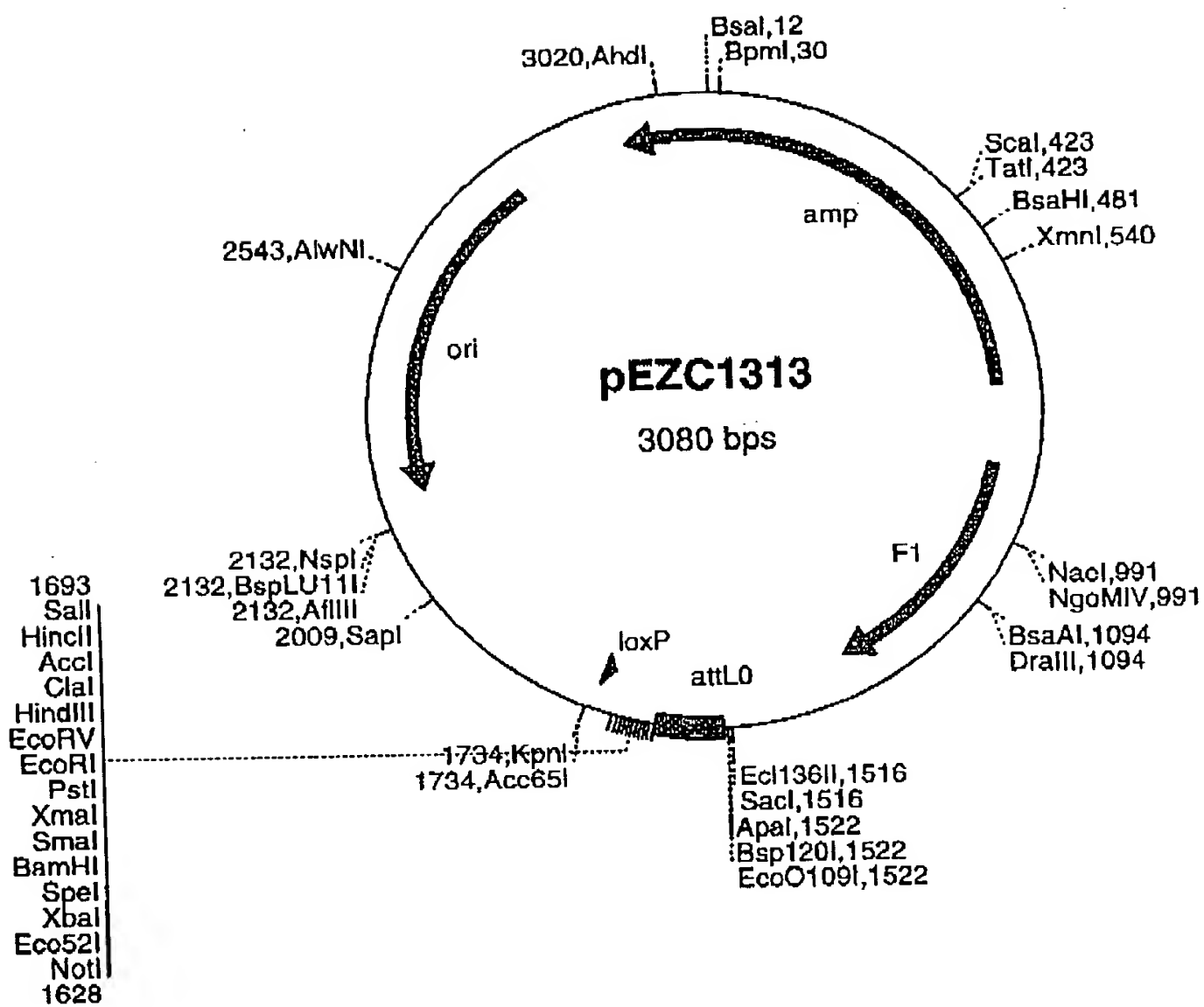


FIGURE 85

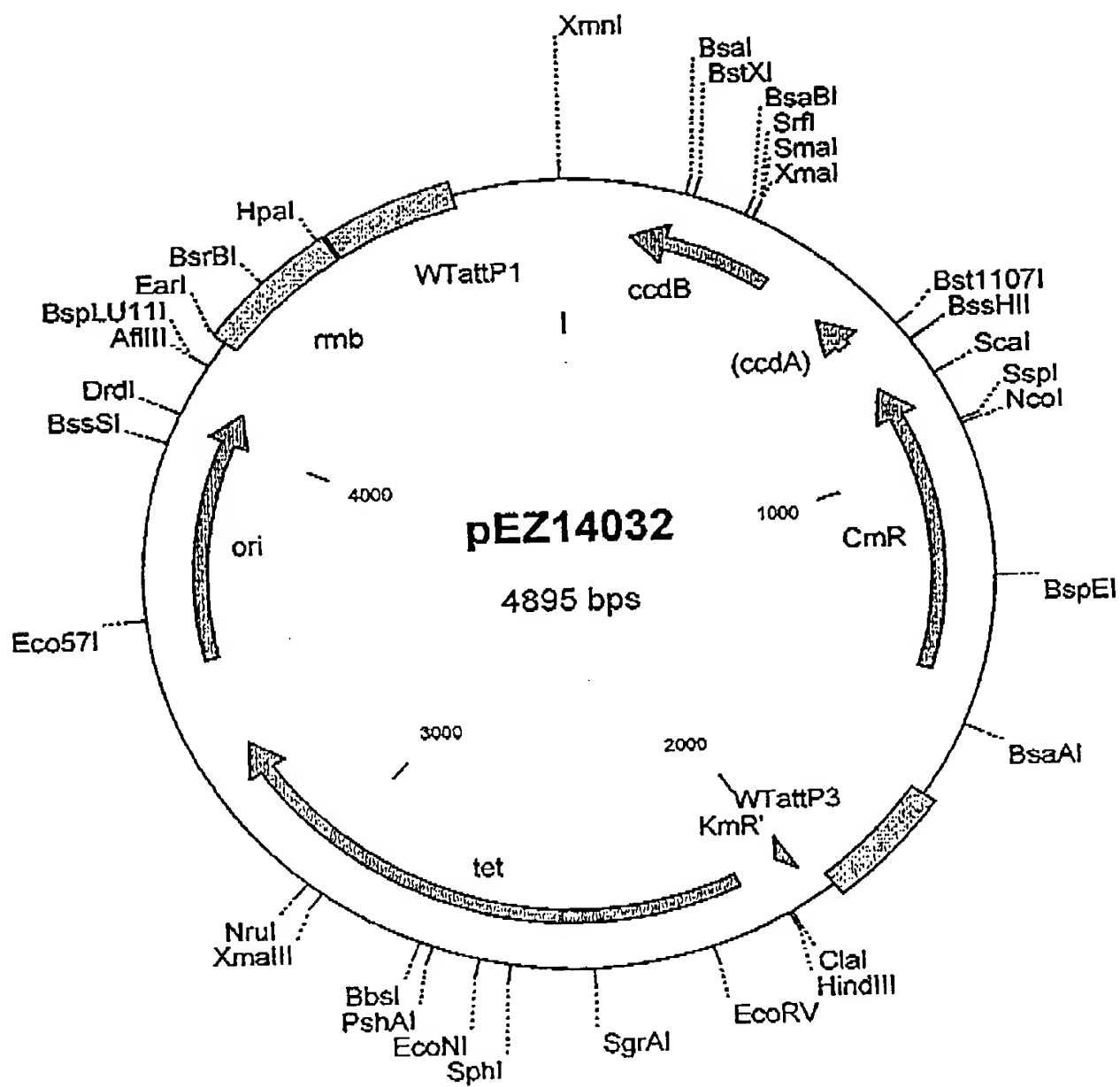
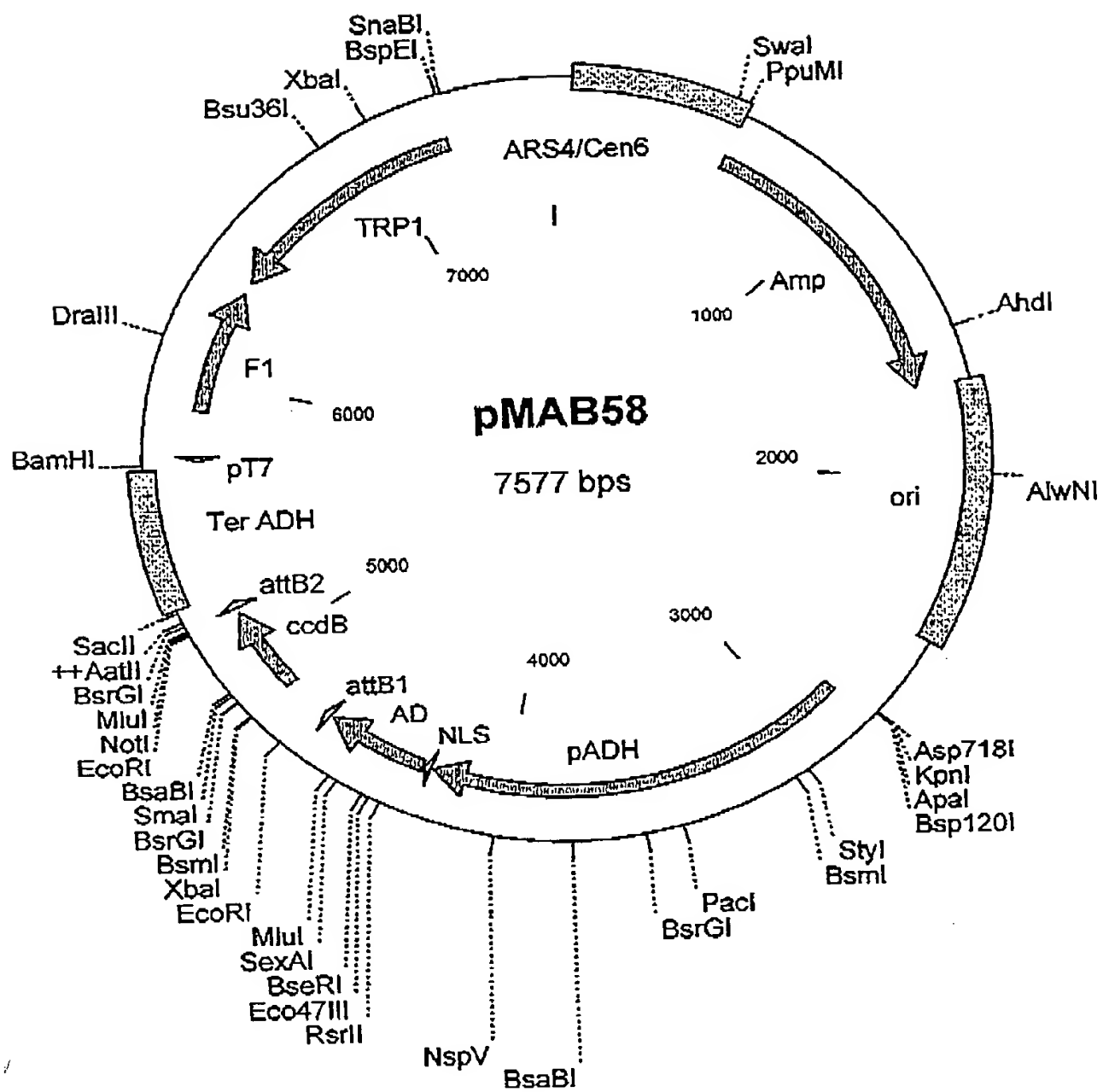
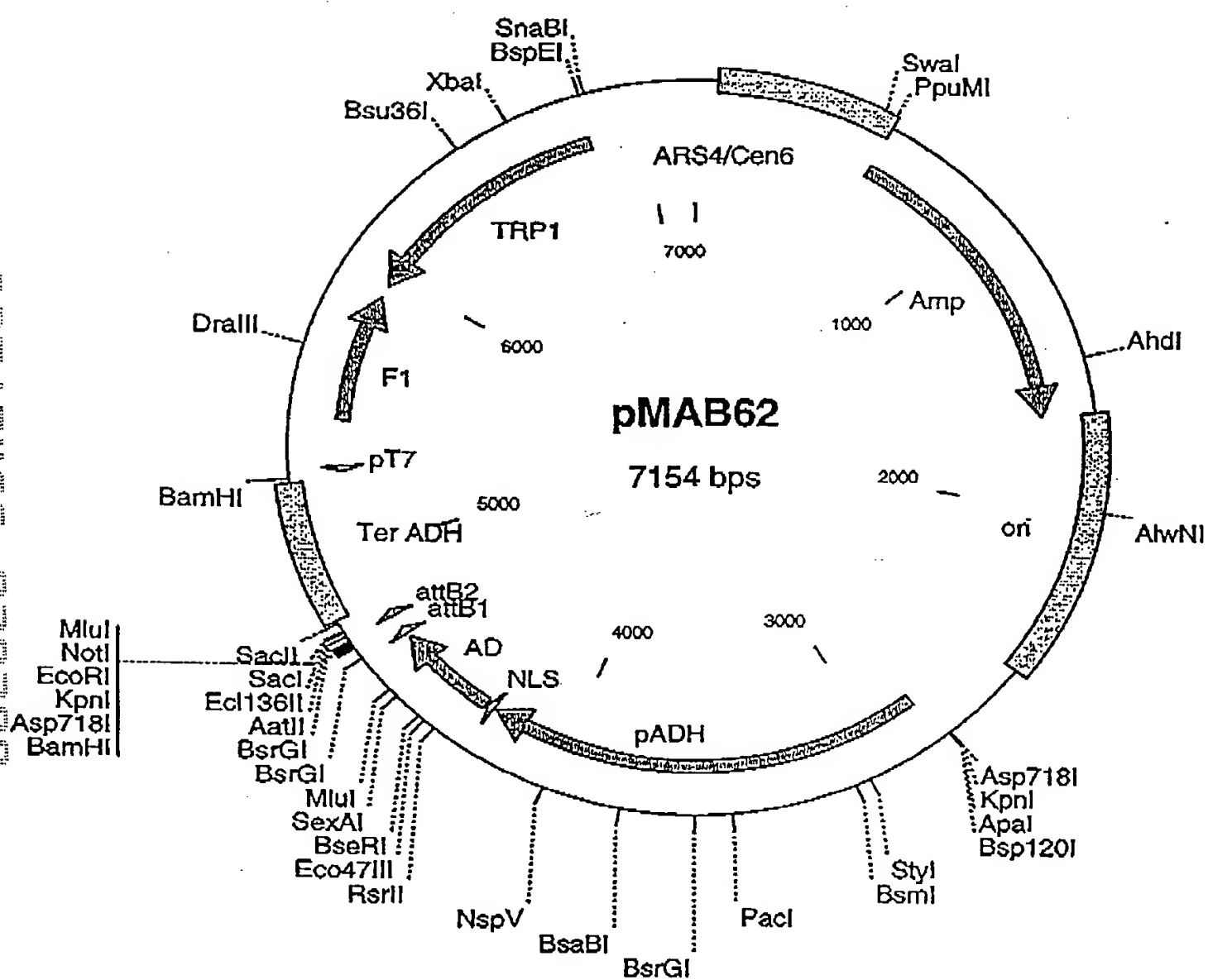
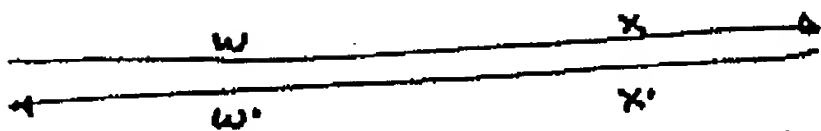


FIGURE 86

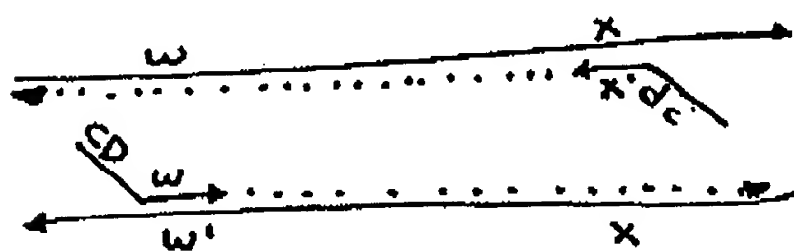
[illegible]

[illegible]

DNA to be amplified (5' → 3'):



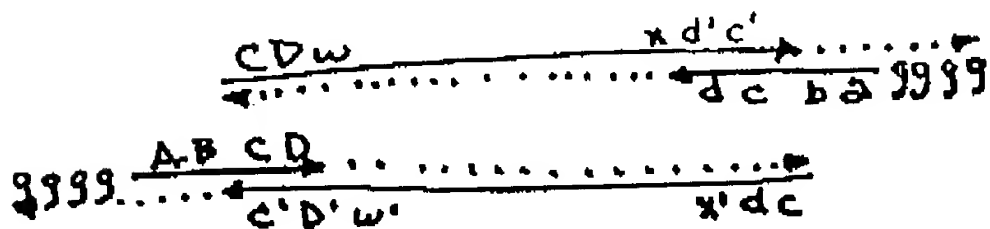
↓ Denature, anneal
hybrid primers,
↓ extend with polymerase



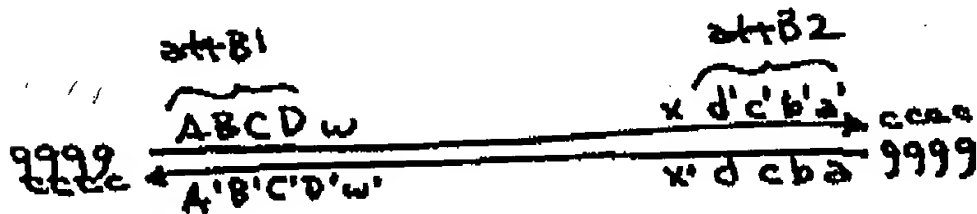
↓ amplification cycles



↓ Denature, anneal
attB primers,
extend with polymerase



↓ amplification cycles



attB1 primer:

9999 $\xrightarrow{A B C D}$

attB2 primer:

9999 $\xrightarrow{a b c d}$

Hybrid primers (part
attB, part gene
specific):

$\xrightarrow{c D w}$

$\xrightarrow{c d x'}$

FIGURE 89

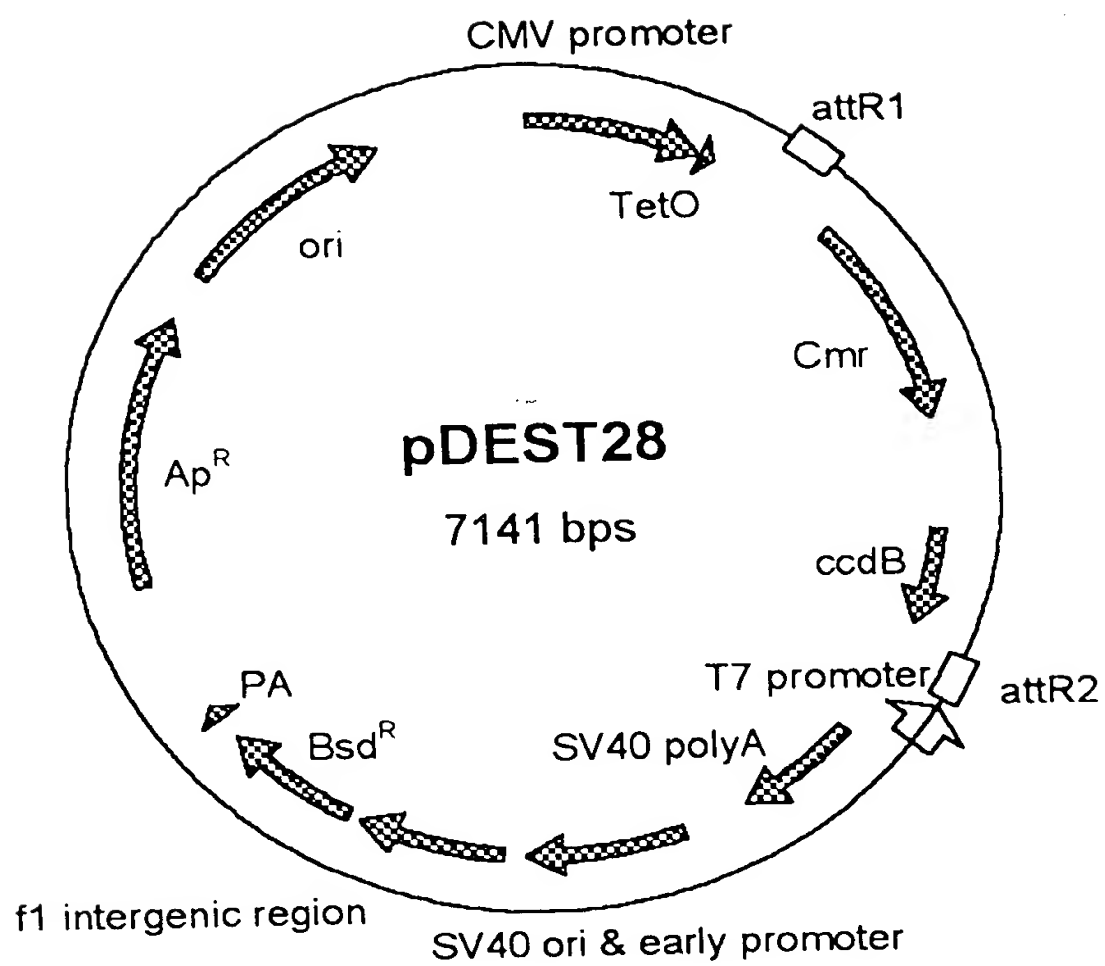


FIGURE 90A

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGAC
TCACGGGGATTTCCTAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTGTTTGGCACCA
AATCAACGGGACTTTCCTAATAATGTCGTAACAACCTCCGCCCCATTGACGCAAATGGGCGGT
AGGCGTGACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACT
CTAGAGGATCCCTACCGGTGATATCCTCGAGCCCATCAACAAGTTTGTACAAAAAAGCTG
AACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGGCGGCCGCATTAGGCAC
CCCAGGCTTTTACACTTTTATGCTTCCGGCTCGTATAATGTGTGGATTGTTGAGTTAGGATCC
GGCGAGATTTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCAC
CGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGAGGCATTTTCAGTCAGTTGCTCA
ATGTACCTATAACCAGACCGTTCAGCTGGATATTACGGCCTTTTTTAAAGACCGTAAAGAA
AAATAAGCACAAGTTTTATCCGGCCTTTATTTCACATTCTTGCCCGCCTGATGAATGCTCA
TCCGGAATTCCGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCC
TTGTTACACCGTTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGCTCTGGAGTGAATACCA
CGACGATTTCCGGCAGTTTTCTACACATATATTCGCAAGATGTGGCGTGTTACGGTGAAAA
CCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTTCGTCTCAGCCAATCCCTG
GGTGAGTTTTCACCAGTTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTCGCCCCCGT
TTTCACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTCA
GGTTCATCATGCCGTCTGTGATGGCTTCCATGTCGGCAGAATGCTTAATGAATTACAACA
GTACTGCGATGAGTGGCAGGGCGGGGCGTAAAGATCTGGATCCGGCTTACTAAAAGCCAG
ATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAATATATACTGATATGTA
TACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGAC
AGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCA
CAACCATGCAGAATGAAGCCCGTCGTCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGG
AAGGGATGGCTGAGGTGCCCCGGTTTTATTGAAATGAACGGCTCTTTTGCTGACGAGAACA
GGGACTGGTGAAATGCAGTTTAAGGTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTG
TTTGTGGATGTACAGAGTGATATTATTGACACGCCCCGGGCGACGGATGGTGATCCCCCTG
GCCAGTGACGTCTGCTGTGATGATAAAGTCTCCCGTGAACCTTACCCGGTGGTGATATC
GGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGCTCTCCGTTATC
GGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTG
ATGTTCTGGGGAATATAAATGTCAGGCTCCCTTATACACAGCCAGTCTGCAGGTGACCA
TAGTGACTGGATATGTTGTGTTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTA
ATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTCAGCTTTCTTGTACAAAGT
GGTTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGCATGCGACGTCATAGCTC
TCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGTTTTTACAACGTCGTGA
CTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTTCTGTGGTGTGACATA
ATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATATAAAATTTTTTAAGTGT
ATAATGTGTTAAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTTGCTTACTGAGTATGA
TTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTGTGTATTTTAGATTCA
CAGTCCCAAGGCTCATTTTACAGGCCCTCAGTCCTCACAGTCTGTTTCATGATCATAATCAG
CCATACCACATTTGTAGAGGTTTTTACTTGCTTTAAAAAACCTCCACACCTCCCCCTGAA
CCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGTCAGCTTATAATGG
TTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCATT
TAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCGATCCTGCATT
AATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTTGCGTATTGGCTGGCGTAATAGCGAAG
AGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGGACGCGC
CCTGTAGCGGCGCATTAAGCGCGGGGCGGTGTGGTGGTTACGCGCAGCGTGACCGCTACAC
TTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCTTCTCGCCACGTTTCG
CCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTT-

Figure 90B

TACGGCACCTCGACCCCCAAAAA ACTTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGC
CCTGATAGACGGTTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCT
TGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGA
TTTTGCCGATTTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAATATTTAACGCGA
ATTTTAACAAAATATTAACGTTTACAATTTTCGCCTGATGCGGTATTTTCTCCTTACGCAT
CTGTGCGGTATTTTACACCCGCATACGCGGATCTGCGCAGCACCATGGCCTGAAATAACCT
CTGAAAGAGGA ACTTTGGTTAGGTACCTTCTGAGGCGGAAAGAACCAGCTGTGGAATGTGT
GTCAGTTAGGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTATGCAAAGCATGC
ATCTCAATTAGTTCAGCAACCAGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTA
TGCAAAGCATGCATCTCAATTAGTTCAGCAACCATAGTCCCGCCCCCTAACTCCGCCCCATCC
CGCCCCCTAACTCCGCCCCAGTTCCGCCCCATTTCTCCGCCCCATGGCTGACTAATTTTTTTTA
TTTATGCAGAGGCCGAGGCCGCTCGGCCTCTGAGCTATTCCAGAAGTAGTGAGGAGGCT
TTTTTGGAGGCC TAGGCTTTTGTCAAAAAGCTTGATTCTTCTGACACAACAGTCTCGAACT
TAAGACCATGGCCAAGCCTTTGTCTCAAGAAGAATCCACCCTCATTGAAAGAGCAACGGC
TACAATCAACAGCATCCCCATCTCTGAAGACTACAGCGTCGCCAGCGCAGCTCTCTCTAG
CGACGGCCGCATCTTCACTGGTGTCAATGTATATCATTTTTACTGGGGGACCTTGTGCAGA
ACTCGTGGTGCTGGGCACTGCTGCTGCTGCGGCAGCTGGCAACCTGACTTGTATCGTCGC
GATCGGAAATGAGAACAGGGGCATCTTGAGCCCCCTGCGGACGGTGCCGACAGGTGCTTCT
CGATCTGCATCCTGGGATCAAAGCCATAGTGAAGGACAGTGATGGACAGCCGACGGCAGT
TGGGATTCGTGAATTGCTGCCCTCTGGTTATGTGTGGGAGGGCTAAGCACTTCGTGGCCG
AGTTCGAAATGACCGACCAAGCGACGCCCAACCTGCCATCACGATGGCCGCAATAAAATA
TCTTTATTTTTATTACATCTGTGTGTTGGTTTTTTGTGTGAATCGATAGCGATAAGGATC
CGCGTATGGTGCATCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGA
CACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTAC
AGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTTACCAGTCATCACCG
AAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTTATAGGTTAATGTCATGATA
ATAATGGTTTTCTTAGACGTCAGGTGGCACTTTTTCGGGGAAATGTGCGCGGAACCCCTATT
TGTTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAA
ATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCCCTT
ATTCCCTTTTTTTCGGGCATTTTGCCTTCCTGTTTTTTGCTCACCCAGAAACGCTGGTGAAA
GTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTCAAC
AGCGGTAAAGATCCTTGAGAGTTTTTCGCCCCGAAGAACGTTTTTCCAATGATGAGCACTTTT
AAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGT
CGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAGCAT
CTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAAC
ACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTG
CACAAACATGGGGGATCATGTAACCTGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCC
ATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAA
CTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAG
GCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTTATTGCT
GATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGAT
GGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAA
CGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGAC
CAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTTTAATTTAAAGGATC
TAGGTGAAGATCCTTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTTCGTTT
CACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTG
CGCGTAATCTGCTGCTTGCAAACAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCG
GATCAAGAGCTACCAACTCTTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCA
AATACTGTCCTTCTAGTG TAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCG
CCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCG
TGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGA
ACGGGGGGTTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATAC
CTACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTAT
CCGGTAAGCGGCAGGGTTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCC
TGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGA
TGCTCGTCAGGGGGGCGGAGCCTATGGAAAACGCCAGCAACGCGGCCTTTTTACGGTTC
CTGGCCTTTTTGCTGGCCTTTTGTCTCACATGTTCTTTCTGCGTTATCCCCTGATTCTGTG
GATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAG-

FIGURE 90C

CGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCC
GCGCGTTGGCCGATTCATTAATGCAGAGCTTGCAATTCGCGCGTTTTTCAATATTATTGA
AGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAAT
AAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCTAAGAAACC
ATTATTATCATGACATTAACCTATAAAAATAGGCGTAGTACGAGGCCCTTTCACTCATTA
G

FIGURE 90D

002060 "0047660

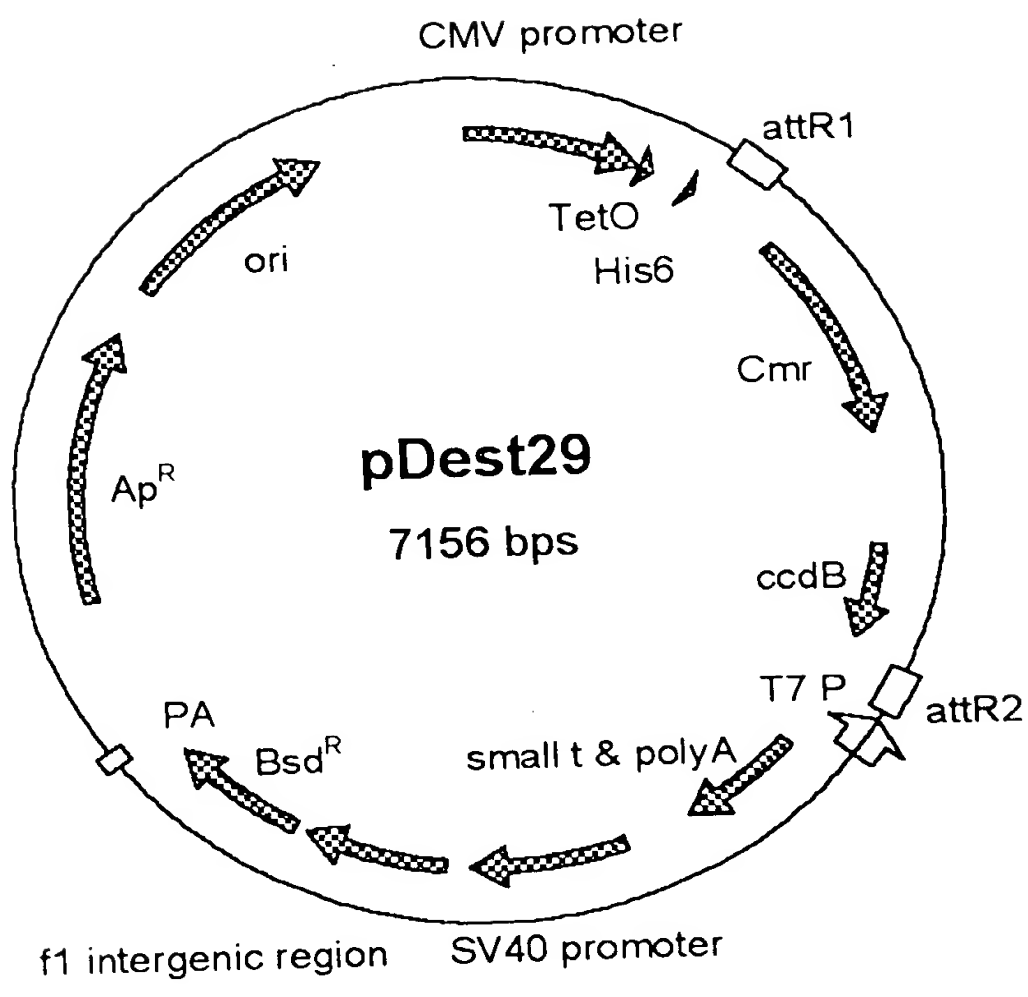


FIGURE 91 A

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCCGCTGGCTGACCGCCCAACGACCCC
CGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCCGCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTTCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGAC
TCACGGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAA
AATCAACGGGACTTTCCAAAATGTCGTAACAACCTCCGCCCCATTGACGCAAATGGGCGGT
AGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACC
ATGGCGTACTACCATCACCATCACCATCACCCTGATATCCTCGAGCCCATCACAAGT
TTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAG
ATTTTGCATAAAAAACAGACTACATAACTGTAAAACACAACATATCCAGTCACTATGG
CGGCCGCATTAGGCACCCCAAGGCTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGA
TTTTGAGTTAGGATCCGGCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAAA
TCACTGGATATACCACCGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGGAGGCAT
TTCAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTTTCAGCTGGATATTACGGCCTTTT
TAAAGACCGTAAAGAAAAATAAGCACAAAGTTTTATCCGGCCTTTATTACATTCTTGCCC
GCCTGATGAATGCTCATCCGGAATTCCGTATGGCAATGAAAGACCGTGAGCTGGTGATAT
GGGATAGTGTTACCCCTTGTTACACCGTTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGC
TCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATATATTCGCAAGATGTGG
CGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTCG
TCTCAGCCAATCCCTGGGTGAGTTTTACCAGTTTTTGATTTAAACGTGGCCAATATGGACA
ACTTCTTCCGCCCCCGTTTTTACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGA
TGCCGCTGGCGATTACAGGTTTCATCATGCCGTCTGTGATGGCTTCCATGTCGGCAGAATGC
TTAATGAATTACAACAGTACTGCGATGAGTGGCAGGGCGGGGCGTAAACGCGTGATCCG
GCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTTGCGGTATAAGAA
TATATACTGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTAT
TACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATC
TCCGGTCTGGTAAGCACAACCATGCAGAATGAAGCCCGTCGTCTGCGTGCCGAACGCTGG
AAAGCGGAAAATCAGGAAGGGATGGCTGAGGTGCGCCCGGTTTTATTGAAATGAACGGCTCT
TTTGCTGACGAGAACAGGGACTGGTGAAATGCAGTTTAAAGGTTTACACCTATAAAAGAGA
GAGCCGTTATCGTCTGTTTTGTGGATGTACAGAGTGATATTATTGACACGCCCCGGGCGACG
GATGGTGATCCCCCTGGCCAGTGCACGTCTGCTGTCAGATAAAGTCTCCCGTGAACTTTA
CCCGGTGGTGATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGT
GCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAA
AAACGCCATTAACTGATGTTCTGGGGAATATAAATGTCAGGCTCCGTTATACACAGCCA
GTCTGCAGGTCGACCATAGTGACTGGATATGTTGTGTTTTTACAGTATTATGTAGTCTGTT
TTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTTACG
CTTTCTTGTACAAAGTGGTGATGGGCGGCGCTCTAGAGGGCCCAAGCTTACGCGTGCAT
GCGACGTCATAGCTCTCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGT
TTTACAACGTCGTGACTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTT
CTGTGGTGTGACATAATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATAT
AAAATTTTTTAAGTGTATAATGTGTTAAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTTT
GCTTACTGAGTATGATTTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTTG
TGATTTTTTAGATTCACAGTCCCAAGGCTCATTTTCAGGCCCCCTCAGTCCTCACAGTCTGTT
CATGATCATAATCAGCCATAACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCC
ACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTTAT
TGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAATTTTACAAATAAAGCATT
TTTTTCACTGCATTCTAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTTATCATGTCTG
GATCGATCCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTTGCGTATTGGCT
GGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATG
GCGAATGGGACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCA
GCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCCCT
TTCTCGCCACGTTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGT-

FIGURE 91B

A



ATGCATGTCGTTACATAACTTACGGTAAATGGCCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTTCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGAC
TCACGGGGGATTTCCAAGTCTCCACCCCATGACGTCAATGGGAGTTTGTTTTGGCACCAA
AATCAACGGGACTTTCCAAAATGTCTGTAACAACCTCCGCCCCATTGACGCAAATGGGCGGT
AGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACT
CTAGAGGATCCCTACCGGTGATATCCTCGAGCCCATCAACAAGTTTGTACAAAAAAGCTG
AACGAGAAACGTAAAATGATATAAATATCAATATATTAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGGCGGCCGCATTAGGCAC
CCCAGGCTTTTACACTTTTATGCTTCCGGCTCGTATAATGTGTGGATTTTGTAGTTAGGATCC
GGCGAGATTTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCAC
CGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGTAGGCATTTTCAGTCAGTTGCTCA
ATGTACCTATAAACCAGACCGTTTCAGCTGGATATTACGGCCTTTTTTAAAGACCGTAAAGAA
AAATAAGCACAAGTTTTATCCGGCCTTTATTTCACATTCTTGCCCGCCTGATGAATGCTCA
TCCGGAATTCCGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCCC
TTGTTACACCGTTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGCTCTGGAGTGAATACCA
CGACGATTTCCGGCAGTTTTCTACACATATATTTCGCAAGATGTGGCGTGTTACGGTGAAAA
CCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTTCGTCTCAGCCAATCCCTG
GGTGAGTTTCACCAGTTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTTCGCCCCCGT
TTTCACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTCA
GGTTCATCATGCCGTCTGTGATGGCTTCCATGTCGGCAGAATGCTTAATGAATTACAACA
GTACTGCGATGAGTGGCAGGGCGGGGCGTAAAGATCTGGATCCGGCTTACTAAAAGCCAG
ATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAATATATACTGATATGTA
TACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGAC
AGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCA
CAACCATGCAGAATGAAGCCCGTCTGCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGG
AAGGGATGGCTGAGGTGCGCCCGGTTTTATTGAAATGAACGGCTCTTTTGCTGACGAGAAC
GGGACTGGTGAAATGCAGTTTAAAGTTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTG
TTTGTGGATGTACAGAGTGATATTATTGACACGCCCCGGGCGACGGATGGTGATCCCCCTG
GCCAGTGACGCTCTGCTGTCAGATAAAGTCTCCCGTGAACCTTACCCGGTGGTGATATC
GGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTCTCCGTTATC
GGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTG
ATGTTCTGGGGAATATAAATGTCAGGCTCCCTTATACACAGCCAGTCTGCAGGTCGACCA
TAGTGACTGGATATGTTGTGTTTTTACAGTATTATGTAGTCTGTTTTTTTATGCAAAATCTA
ATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTTCAGCTTTCTTGTACAAAGT
GGTTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGCATGCGACGTCATAGCTC
TCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGTTTTTACAACGTCGTGA
CTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTTCTGTGGTGTGACATA
ATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATATAAAATTTTTTAAGTGT
ATAATGTGTTAAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTTTGCTTACTGAGTATGA
TTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTGTGTATTTTAGATTCA
CAGTCCCAAGGCTCATTTTCAGGCCCCCTCAGTCCTCACAGTCTGTTTCATGATCATAATCAG
CCATACCACATTTGTAGAGGTTTTTACTTGCTTTAAAAAACCTCCCACACCTCCCCCTGAA
CCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTTATTGCAGCTTATAATGG
TTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCATTC
TAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCGATCCTGCATT
AATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTTGCGTATTGGCTGGCGTAATAGCGAAG
AGGCCCCGACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGGACGCGC
CCTGTAGCGGCGCATTAAGCGCGGGGCGGTGTGGTGGTTACGCGCAGCGTGACCGCTACAC
TTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCTCTCGCCACGTTTCG
CCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTT-

TACGGCACCTCGACCCCCAAAAAAGTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGC
CCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCT
TGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGA
TTTTGCCGATTTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAATATTTAACGCGA
ATTTTAACAAATATTAACGTTTACAATTTTCGCCTGATGCGGTATTTTCTCCTTACGCAT
CTGTGCGGTATTTTACACCGCATACGCGGATCTGCGCAGCACCATGGCCTGAAATAACCT
CTGAAAGAGGAACTTGGTTAGGTACCTTCTGAGGCGGAAAGAACCAGCTGTGGAATGTGT
GTCAGTTAGGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTATGCAAAGCATGC
ATCTCAATTAGTCAGCAACCAGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTA
TGCAAAGCATGCATCTCAATTAGTCAGCAACCATAGTCCCGCCCCCTAACTCCGCCCCATCC
CGCCCCCTAACTCCGCCCCAGTTCCGCCCCATTCTCCGCCCCATGGCTGACTAATTTTTTTTA
TTTATGCAGAGGCCGAGGCCCTCGGCCTCTGAGCTATTCCAGAAGTAGTGAGGAGGCT
TTTTTGGAGGCCTAGGCTTTTGCAAAAAGCTTGATTCTTCTGACACAACAGTCTCGAACT
TAAGGCTAGAGCCACCATGATTGAACAAGATGGATTGCACGCAGGTTCTCCGGCCGCTTG
GGTGGAGAGGCTATTCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATGCCGC
CGTGTTCGGCTGTGCTCAGCGCAGGGGCGCCCCGGTTCTTTTTTGTCAAGACCGACCTGTCCGG
TGCCCTGAATGAACTGCAGGACGAGGCAGCGCGGCTATCGTGGCTGGCCACGACGGGCGT
TCCTTGCGCAGCTGTGCTCGACGTTGTCACTGAAGCGGGAAGGGACTGGCTGCTATTGGG
CGAAGTGCCGGGGCAGGATCTCCTGTCTCATCTCACCTTGCTCCTGCCGAGAAAGTATCCAT
CATGGCTGATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTACCTGCCCATTCGACCA
CCAAGCGAAACATCGCATCGAGCGAGCACGTAAGGATGGAAGCCGGTCTTGTGCTGATCA
GGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAACTGTTCCGCCAGGCTCAA
GGCGCGCATGCCCCGACGGCGAGGATCTCGTCTGACCCATGGCGATGCCTGCTTGCCGAA
TATCATGGTGGAAAATGGCCGCTTTTCTGGATTTCATCGACTGTGGCCGGCTGGGTGTGGC
GGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGGCGA
ATGGGCTGACCGCTTCTCTCGTGCTTTACGGTATCGCCGCTCCCGATTTCGACGCGCATCGC
CTTCTATCGCCTTCTTGACGAGTTCTTCTGAGCGGGACTCTGGGGTTTCGAAATGACCGAC
CAAGCGACGCCCAACCTGCCATCACGATGGCCGCAATAAAATATCTTTATTTTCATTACA
TCTGTGTGTTGGTTTTTTGTGTGAATCGATAGCGATAAGGATCCGCGTATGGTGCACCTCT
CAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCGCCAACACCCGC
TGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGACAAGCTGTGACCGT
CTCCGGGAGCTGCATGTGTGAGAGGTTTTACCGTTCATCACCGAAACGCGCGAGACGAAA
GGGCTCGTGATACGCCTATTTTTTATAGGTTAATGTGATGATAATAATGGTTTCTTAGAC
GTCAGGTGGCACTTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAAT
ACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTG
AAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGCCCTTATTCCCTTTTTTTCGCGC
ATTTTGCCTTCTGTTTTTGTCTCACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGA
TCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTCAACAGCGGTAAAGATCCTTGA
GAGTTTTTCGCCCCGAAGAACGTTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGG
CGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTGCGCCGCATACACTATTC
TCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGAC
AGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACT
TCTGACAACGATCGGAGGACCGAAGGAGCTAACCCTTTTTTGCACAACATGGGGGATCA
TGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATAACCAAACGACGAGCG
ACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGG
ACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTTATTGCTGATAAATCTGGAGCCGG
TGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTAT
CGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGC
TGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATATAT
ACTTTAGATTGATTTAAAACCTTCATTTTTTAATTTAAAAGGATCTAGGTGAAGATCCTTTT
TGATAATCTCATGACCAAAAATCCCTTAACGTGAGTTTTTCGTTCCACTGAGCGTCAGACCC
CGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTT
GCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTTGTTTGCCGGATCAAGAGCTACCAAC
TCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATAACCAATACTGTCCTTCTAGT
GTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTCT
GCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGA
CTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGAACGGGGGGTTCTGTGCAC-

FIGURE 92C

ACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCATTG
AGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGT
CGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCC
TGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTTGTGATGCTCGTCAGGGGGGCG
GAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTTACGGTTCCTGGCCTTTTGCTGGCC
TTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACCGC
CTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAG
CGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATTCA
TTAATGCAGAGCTTGCAATTGCGCGGTTTTTCAATATTATTGAAGCATTTATCAGGGTTA
TTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAATAGGGGTTC
GCGCACATTTCCCCGAAAAGTGCCACCTGACGTCTAAGAAACCATTATTATCATGACATT
AACCTATAAAAATAGGCGTAGTACGAGGCCCTTTCACTCATTAG

FIGURE 92D

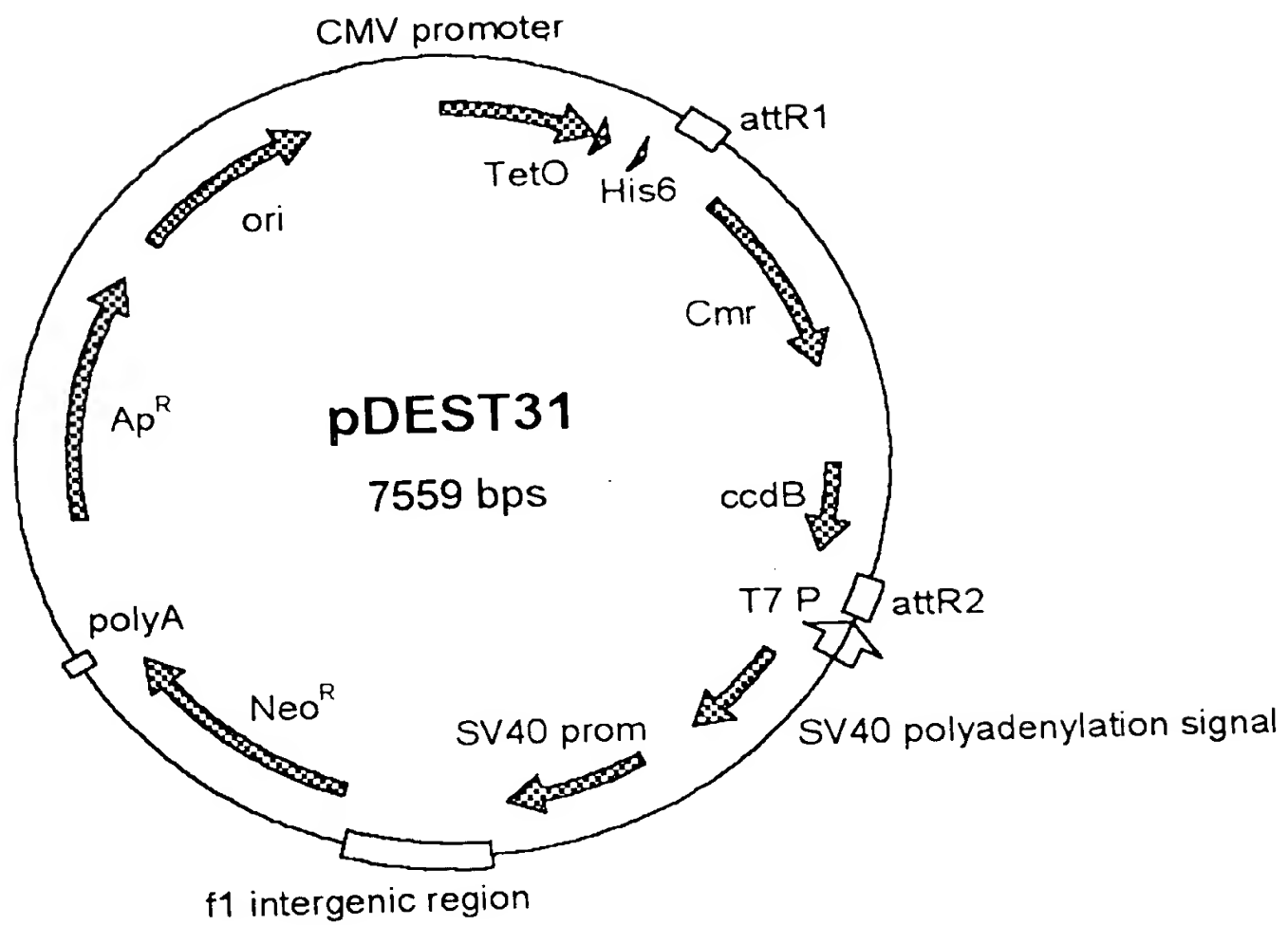


FIGURE 93A

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGTATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGAC
TCACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTTTTGGCACCAA
AATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGT
AGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACC
ATGGCGTACTACCATCACCATCACCATCACACCGGTGATATCCTCGAGCCCATCACAAGT
TTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAG
ATTTTGCATAAAAAACAGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGG
CGGCCGCATTAGGCACCCCAGGCTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGA
TTTTGAGTTAGGATCCGGCGAGATTTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAA
TCACTGGATATACCACCGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGAGGCAT
TTCAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTTTCAGCTGGATATTACGGCCTTTT
TAAAGACCGTAAAGAAAAATAAGCACAGTTTTATCCGGCCTTTATTACATTCTTGCCC
GCCTGATGAATGCTCATCCGGAATTCCGTATGGCAATGAAAGACGGTGAGCTGGTGATAT
GGGATAGTGTTACCCCTTGTTACACCGTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGC
TCTGGAGTGAATACCACGACGATTTCCGGCAGTTTTCTACACATATATTGCAAGATGTGG
CGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTTCG
TCTCAGCCAATCCCTGGGTGAGTTTTCACAGTTTTGATTTAAACGTGGCCAATATGGACA
ACTTCTTCGCCCCCGTTTTTACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGA
TGCCGCTGGCGATTTCAGGTTTCATCATGCCGTCTGTGATGGCTTCCATGTCCGCAGAATGC
TTAATGAATTACAACAGTACTGCGATGAGTGGCAGGGCGGGCGGTAAACGCGTGATCCG
GCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTTGCGGTATAAGAA
TATATACTGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTAT
TACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATC
TCCGGTCTGGTAAGCACAAACCATGCAGAATGAAGCCCGTCTGCTGCGTGCCGAACGCTGG
AAAGCGGAAAATCAGGAAGGGATGGCTGAGGTGCGCCCGGTTTTATTGAAATGAACGGCTCT
TTTGCTGACGAGAACAGGGACTGGTGAAATGCAGTTTAAGGTTTACACCTATAAAAGAGA
GAGCCGTTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTGACACGCCCCGGGCGACG
GATGGTGATCCCCCTGGCCAGTGCACGTCTGCTGTGAGATAAAGTCTCCCGTGAACCTTA
CCCGGTGGTGATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGT
GCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAA
AAACGCCATTAACCTGATGTTCTGGGGAATATAAATGTCAGGCTCCGTTATACACAGCCA
GTCTGCAGGTGACCATAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTT
TTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTTTTACGTTTCTCGTTTACG
GCGACGTCATAGCTCTCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGT
TTTACAACGTCGTGACTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTT
CTGTGGTGTGACATAATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATAT
AAAATTTTTAAGTGTATAATGTGTTAAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTT
GCTTACTGAGTATGATTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTG
TGTATTTTAGATTCACAGTCCCAAGGCTCATTTTCAGGCCCTCAGTCCCTCACAGTCTGTT
CATGATCATAATCAGCCATACCACATTTGTAGAGGTTTTTACTTGCTTTAAAAAACCTCCC
ACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTAT
TGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATT
TTTTTCACTGCATTCTAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTTATCATGTCTG
GATCGATCCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTTGCGTATTGGCT
GGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATG
GCGAATGGGACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGTGTTACGCGCA
GCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCCT
TTCTCGCCACGTTTCGCCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGT-

TCCGATTTAGTGCTTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTCAC
 GTAGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT
 TTAATAGTGGACTCTTGTTCCAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTT
 TTGATTTATAAGGGATTTTGGCCGATTTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAAC
 AAATATTTAACGCGAATTTTAAACAAAATATTAACGTTTACAATTTTCGCCTGATGCGGTAT
 TTTCTCCTTACGCATCTGTGCGGTATTTACACACCGCATAACGCGGATCTGCGCAGCACCAT
 GGCCTGAAATAACCTCTGAAAGAGGAACCTTGGTTAGGTACCTTCTGAGGCGGAAAGAACC
 AGCTGTGGAATGTGTGTGTCAGTTAGGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAA
 GTATGCAAAGCATGCATCTCAATTAGTCAGCAACCAGGTGTGGAAAGTCCCCAGGCTCCC
 CAGCAGGCAGAAAGTATGCAAAGCATGCATCTCAATTAGTCAGCAACCATAGTCCCGCCCC
 TAACTCCGCCCCATCCCGCCCCCTAACTCCGCCCCAGTTCCGCCCCATTCTCCGCCCCCATGGCT
 GACTAATTTTTTTTTATTTATGTCAGAGGCCGAGGCCGCTCGGCCTCTGAGCTATTCCAGA
 AGTAGTGAGGAGGCTTTTTTGGAGGCCCTAGGCTTTTGCAAAAAGCTTGATTCTTCTGACA
 CAACAGTCTCGAACTTAAGGCTAGAGCCACCATGATTGAACAAGATGGATTGCACGCAGG
 TTCTCCGGCCCGCTTGGGTGGAGAGGCTATTCGGCTATGACTGGGCACAACAGACAATCGG
 CTGCTCTGATGCCGCCGTGTTCCGGCTGTGTCAGCGCAGGGGCGCCCGGTTCTTTTTGTCAA
 GACCGACCTGTCCGGTGCCCTGAATGAACTGCAGGACGAGGCAGCGCGGCTATCGTGGCT
 GGCCACGACGGGCGTTCCTTGCGCAGCTGTGCTCGACGTTGTCACTGAAGCGGGAAGGA
 CTGGCTGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTCTCATCTCACCTTGCTCCTGC
 CGAGAAAGTATCCATCATGGCTGATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTAC
 CTGCCCCATTCGACCACCAAGCGAAACATCGCATCGAGCGAGCACGTACTCGGATGGAAGC
 CGGTCTTGTCGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAACCT
 GTTCGCCAGGCTCAAGGCGCGCATGCCCGACGGCGAGGATCTCGTCGTGACCCATGGCGA
 TGCCTGCTTGCCGAATATCATGGTGGAAAATGGCCGCTTTTCTGGATTTCATCGACTGTGG
 CCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGA
 AGAGCTTGCGGGCGAATGGGCTGACCGCTTCCTCGTGCTTTACGGTATCGCCGCTCCCGA
 TTCGCAGCGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGCGGGACTCTGGGG
 TTCGAAATGACCGACCAAGCGACGCCCAACCTGCCATCACGATGGCCGCAATAAAATATC
 TTTATTTTCATTACATCTGTGTGTTGGTTTTTTGTGTGAATCGATAGCGATAAGGATCCG
 CGTATGGTGCATCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACA
 CCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAG
 ACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGTCAGAGGTTTTTCACCGTCATCACCGAA
 ACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTTATAGGTTAATGTCATGATAAT
 AATGGTTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTG
 TTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAAT
 GCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGCCCTTAT
 TCCCTTTTTTTGCGGCATTTTGCCTTCCTGTTTTTTGCTCACCCAGAAACGCTGGTGAAAGT
 AAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAACAG
 CGGTAAGATCCTTGAGAGTTTTTCGCCCCGAAGAACGTTTTTCCAATGATGAGCACTTTTAA
 AGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTG
 CCGCATACTACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCT
 TACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACAC
 TGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTTGCA
 CAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCAT
 ACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACCT
 ATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGC
 GGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGA
 TAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGG
 TAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACG
 AAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACCTGTCAGACCA
 AGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTTAATTTAAAAGGATCTA
 GGTGAAGATCCTTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTTCGTTCCA
 CTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTTCTGCG
 CGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTGTTGCCGGA
 TCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATAACCAA
 TACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCC
 TACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTG
 TCTTACCAGGTTGGACTCAAGACGATAGTTACCAGGATAAGGCGCAGCGGTGCGGCTGAAC-

Figure 93C

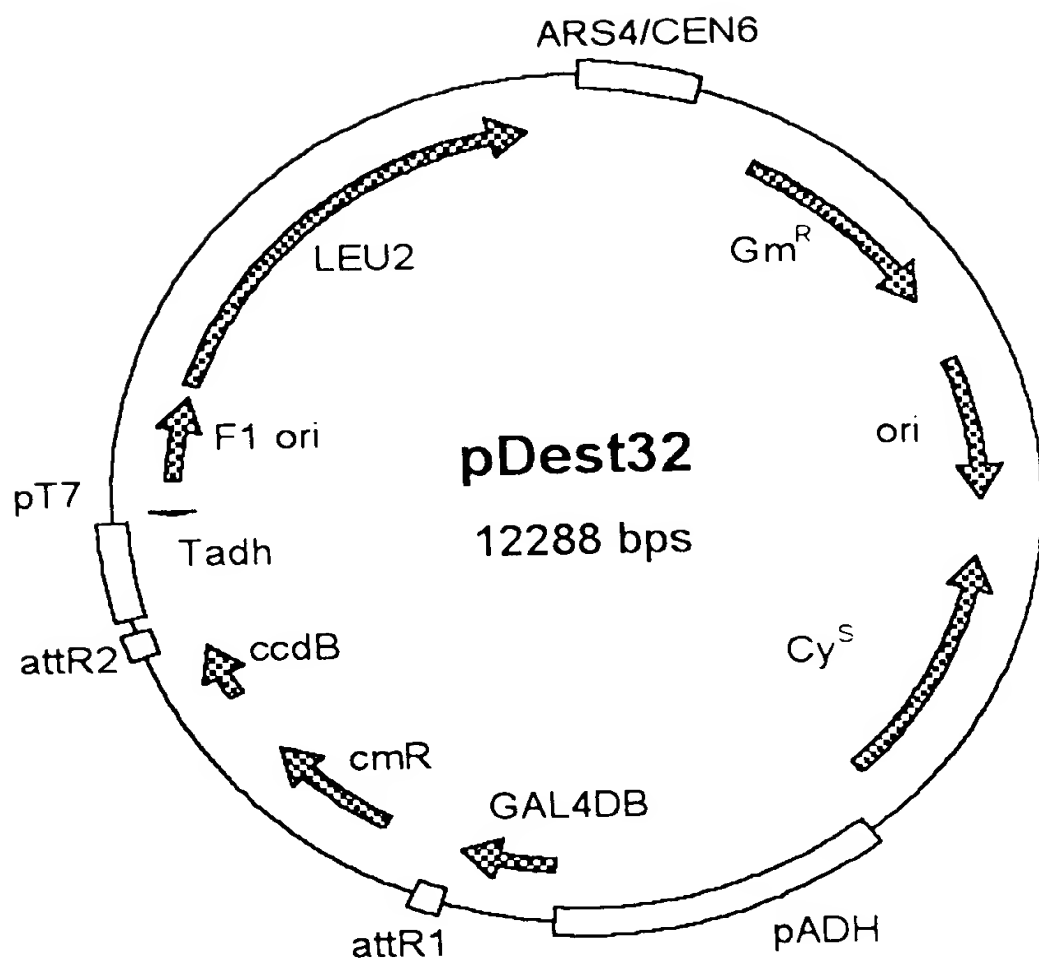


FIGURE 94A

GACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTT
CTTAGGACGGATCGCTTGCCTGTAACCTTACACGCGCCTCGTATCTTTTAATGATGGAATA
ATTTGGGAATTTACTCTGTGTTTATTTATTTTTATGTTTTGTATTTGGATTTTAGAAAGT
AAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAAAATAAACAAAGGTTTAAAAA
ATTTCAACAAAAAGCGTACTTTACATATATATTTATTAGACAAGAAAAGCAGATTAAATA
GATATACATTCGATTAACGATAAGTAAAATGTAAAATCACAGGATTTTCGTGTGTGGTCT
TCTACACAGACAAGATGAAACAATTCGGCATTAATACCTGAGAGCAGGAAGAGCAAGATA
AAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTACATCTTCGGAAAACAAAACT
ATTTTTCTTTAATTTCTTTTTTTTACTTTCTATTTTTTAATTTATATATTTATATAAAA
ATTTAAATTATAATTATTTTTTATAGCACGTGATGAAAAGGACCCAGGTGGCACTTTTCGG
GGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCG
CTCATGAGACAATAACCTGATAAATGCTTCAATAATCTGCAGTGCGCAGGGCCCGTGTC
TCAAAATCTCTGATGTTACATTGCACAAGATAAAAATATATCATCATGAACAATAAACT
GTCTGCTTACATAAACAGTAATAACAAGGGGTGTTATGAGCCATATTCAACGGGAAACGTC
TTGCTGGAGGCCGCGATTAAATTCCAACATGGATGCTGATTTATATGGGTATAAATGGGC
TCGGTAGCCAACCACTAGAACTATAGCTAGAGTCTGGGCGAACAACGATGCTCGCCTT
CCAGAAAACCGAGGATGCGAACCCTTCATCCGGGGTCAGCACCACCGGCAAGCGCCGCG
ACGGCCGAGGTCTTCCGATCTCCTGAAGCCAGGGCAGATCCGTGCACAGCACCTTGCCGT
AGAAGAACAGCAAGGCCGCAATGCCTGACGATGCGTGGAGACCGAAACCTTGCGCTCGT
TCGCCAGCCAGGACAGAAATGCCTCGACTTCGCTGCTGCCCAAGGTTGCCGGGTGACGCA
CACCGTGGAAACGGATGAAGGCACGAACCCAGTTGACATAAGCCTGTTCCGTTTCGTAAAC
TGTAATGCAAGTAGCGTATGCGCTCACGCAACTGGTCCAGAACCTTGACCGAACGCAGCG
GTGGTAACGGCGCAGTGGCGGTTTTTCATGGCTTGTTATGACTGTTTTTTTGTACAGTCTA
TGCCTCGGGCATCCAAGCAGCAAGCGCGTTACGCCGTGGGTGATGTTTGATGTTATGGA
GCAGCAACGATGTTACGCAGCAGCAACGATGTTACGCAGCAGGGCAGTCGCCCTAAAACA
AAGTTAGGTGGCTCAAGTATGGGCATCATTTCGCACATGTAGGCTCGGCCCTGACCAAGTC
AAATCCATGCGGGCTGCTCTTGATCTTTTCGGTCGTGAGTTCGGAGACGTAGCCACCTAC
TCCAACATCAGCCGGAATCCGATTACCTCGGGAACCTTGCTCCGTAGTAAGACATTCATC
GCGCTTGCTGCCTTCGACCAAGAAGCGGTTGTTGGCGCTCTCGCGGCTTACGTTCTGCCC
AGGTTTGAGCAGCCGCGTAGTGAGATCTATATCTATGATCTCGCAGTCTCCGGCGAGCAC
CGGAGGCAGGGCATTGCCACCGCGCTCATCAATCTCCTCAAGCATGAGGCCAACGCGCTT
GGTGCTTATGTGATCTACGTGCAAGCAGATTACGGTGACGATCCCGCAGTGGCTCTCTAT
ACAAAGTTGGGCATACGGGAAGAAGTGATGCACTTTGATATCGACCCAAGTACCGCCACC
TAACAATTCTGTTCAAGCCGAGATCGGCTTCCCGGCCTAATAGGTTGTATTGATGTTGGAC
GAGTCGGAATCGCAGACCGATACCGAGGATCTTGCCATCCTATGGAAGTGCCTCGGTGAGT
TTTCTCCTTCATTACAGAAACGGCTTTTTTCAAAAATATGGTATTGATAATCCTGATATGA
ATAAATTGCAGTTTCATTTGATGCTCGATGAGTTTTTCTAATCAGAATTGGTTAATTGGT
TGTAACACTGGCAGAGCATTACGCTGACTTGACGGGACGGCGNCATGACCAAAATCCCTT
AACGTGAGTTTTTCGTTTCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTT
GAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACCACCGCTACCAG
CGGTGGTTTGTGTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTTCA
GCAGAGCGCAGATACCAATACTGTCCTTCTAGTGATAGCCGTAGTTAGGCCACCACTTCA
AGAATCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTG
CCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGG
CGCAGCGGTGCGGCTGAACGGGGGGTTCGTGCACACAGCCAGCTTGGAGCGAACGACCT
ACACCGAAGTGAAGATACCTACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCCGAAGGGA
GAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGC
TTCCAGGGGGGAACGCCTGGTATCTTTATAGTCTGTGCGGTTTTCGCCACCTCTGACTTG
AGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGAGCCTATGGAAAAACGCCAGCAACG
CGGCCTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTCTGCGT
TATCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCC
GCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATAC
GCAAACCGCCTCTCCCCGCGCGTTGGCCGATTATTAATGCAGCTGGCACGACAGGTTTC
CCGACTGGAAAGCGGGCAGTGAGCGCAACGCAATTAATGTGAGTTACCTCACTCATTAGG
CACCCAGGCTTTACACTTTATGCTTCCGGCTCCTATGTTGTGTGGAATTGTGAGCGGAT
ACAATTTACACAGGAAACAGCTATGACCATGATTACGCCAAGCTCGGAATTAACCCTC-

FIGURE 94B

ACTAAAGGGAACAAAAGCTGGTACCGATCCCGAGCTTTGCAAATTAAGCCTTCGAGCGT
 CCCAAAACCTTCTCAAGCAAGGTTTTTCAGTATAATGTTACATGCGTACACGCGTCTGTAC
 AGAAAAAAGAAAAATTTGAAATATAAATAACGTTCTTAATACTAACATAACTATAAAA
 AAATAAATAGGGACCTAGACTTCAGGTTGTCTAACTCCTTCCTTTTCGGTTAGAGCGGAT
 GTGGGGGGAGGGCGTGAATGTAAGCGTGACATAACTAATTACATGATATCGACAAAGGAA
 AAGGGGCCTGTTTACTCACAGGCTTTTTTCAAGTAGGTAATTAAGTCGTTTCTGTCTTTT
 TCCTTCTTCAACCCACCAAAGGCCATCTTGGTACTTTTTTTTTTTTTTTTTTTTTTTTTT
 TT
 TTTTTTTTCATAGAAATAATACAGAAGTAGATGTTGAATTAGATTAAACTGAAGATATAT
 AATTTATTGGAAAATACATAGAGCTTTTTTGTGATGCGCTTAAGCGATCAATTCAACAAC
 ACCACCAGCAGCTCTGATTTTTTCTTCAGCCAACCTTGGAGACGAATCTAGCTTTGACGAT
 AACTGGAACATTTGGAATTCTACCCCTTACCCAAGATCTTACCGTAACCGGCTGCCAAAGT
 GTCAATAACTGGAGCAGTTTCCTTAGAAGCAGATTTCAAGTATTGGTCTCTCTTGTCTTC
 TGGGATCAATGTCCACAATTTGTCCAAGTTCAAGACTGGCTTCCAGAAATGAGCTTGTTG
 CTTGTGGAAGTATCTCATAACCAACCTTACCGAAATAACCTGGATGGTATTTATCCATGTT
 AATTCTGTGGTGATGTTGACCACCGGCCATACCTCTACCACCGGGGTGCTTTCTGTGCTT
 ACCGATACGACCTTTACCGGCTGAGACGTGACCTCTGTGCTTTCTAGTCTTAGTGAATCT
 GGAAGGCATTCTTGATTAGTTGGATGATTGTTCTGGGATTTAATGCAAAAATCACTTAAG
 AAGGAAAATCAACGGAGAAAGCAAACGCCATCTTAAATATACGGGATACAGATGAAAGGG
 TTTGAACCTATCTGAAAATAGCATTAAACAAGCGAAAAACTGCGAGGAAAATTGTTTGC
 GTCTCTGCGGGCTATTCACGCGCCAGAGGAAAATAGGAAAAATAACAGGGCATTAGAAAA
 ATAATTTTGATTTTGGTAATGTGTGGGTCTGGTGTACAGATGTTACATTGGTTACAGTA
 CTCTTGTTTTTGCTGTGTTTTTCGATGAATCTCCAAAATGGTTGTTAGCACATGGAAGAG
 TCACCGATGCTAAGTTATCTCTATGTAAGCTACGTGGCGTGACTTTTGATGAAGCCGCAC
 AAGAGATACAGGATTGGCAACTGCAAATAGAATCTGGGGATCCCCCTCGAGATCCGGGA
 TCGAAGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATGAAGGCAAAAGACAAATA
 TAAGGGTCGAACGAAAAATAAAGTGAAAAGTGTTGATATGATGTATTTGGCTTTGCGGCG
 CCGAAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCTGTGGCGGACCCGCGCTC
 TTGCCGGCCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGGCGGAGTTTTTTGCGCCTG
 CATTTTCCAAGGTTTACCCTGCGCTAAGGGGCGAGATTGGAGAAGCAATAAGAATGCCGG
 TTGGGGTTGCGATGATGACGACCACGACAACCTGGTGTCAATTATTAAAGTTGCCGAAAGAA
 CCTGAGTGCATTTGCAACATGAGTATACTAGAAGAATGAGCCAAGACTTGCGAGACGCGA
 GTTTGCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAGGTGAGACGCGCATAACC
 GCTAGAGTACTTTGAAGAGGAAACAGCAATAGGGTTGCTACCAGTATAAATAGACAGGTA
 CATACAACACTGGAAATGGTTGTCTGTTTGAGTACGCTTTCAATTCATTTGGGTGTGCAC
 TTTATTATGTTACAATATGGAAGGGAACCTTTACACTTCTCCTATGCACATATATTAATTA
 AAGTCCAATGCTAGTAGAGAAGGGGGTAACACCCCTCCGCGCTCTTTTCCGATTTTTTT
 CTAAACCGTGGAATATTTTCGGATATCCTTTTGTGTTTCCGGGTGTACAATATGGACTTC
 CTCTTTTCTGGCAACCAAACCCATACATCGGGATTCTTATAATACCTTCGTTGGTCTCCC
 TAACATGTAGGTGGCGGAGGGGAGATATACAATAGAACAGATACCAGACAAGACATAATG
 GGCTAAACAAGACTACACCAATTACACTGCCTCATTGATGGTGGTACATAACGAACATAAT
 ACTGTAGCCCTAGACTTGATAGCCATCATCATATCGAAGTTTCACTACCCTTTTTCCATT
 TGCCATCTATTGAAGTAATAATAGGCGCATGCAACTTCTTTTCTTTTTTTTTCTTTTCTC
 TCTCCCCCGTTGTTGTCTCACCATATCCGCAATGACAAAAAAATGATGGAAGACACTAA
 AGGAAAAAATTAACGACAAAGACAGCACAACAGATGTGCTTGTTCAGAGCTGATGAGG
 GGTATCTTCGAACACACGAAACTTTTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCT
 AGCAACGGTATACGGCCTTCTTCTCAGTTACTTGAATTTGAAATAAAAAAAGTTTGCCGC
 TTTGCTATCAAGTATAAATAGACCTGCAATTATTAATCTTTTGTTCCTCGTCATTGTTT
 TCGTTCCCTTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCT
 AATCAACTCCAAGCTTGAAGCAAGCCTCCTGAAAGATGAAGCTACTGTCTTCTATCGAAC
 AAGCATGCGATATTTGCCGACTTAAAAAGCTCAAGTGCTCCAAAGAAAAACCGAAGTGCG
 CCAAGTGCTGAAGAACAACTGGGAGTGTGCTACTCTCCCAAAACCAAAGGTCTCCGC
 TGACTAGGGCACATCTGACAGAAGTGGAATCAAGGCTAGAAAGACTGGAACAGCTATTTCT
 TACTGATTTTTCTCGAGAAGACCTTGACATGATTTTGAAAATGGATTCTTTACAGGATA
 TAAAAGCATTGTTAACAGGATTATTTGTACAAGATAATGTGAATAAAGATGCCGTCACAG
 ATAGATTGGCTTCAGTGGAGACTGATATGCCTCTAACATTGAGACAGCATAGAATAAGTG
 CGACATCATCATCGGAAGAGAGTAGTAACAAAGGTCAAAGACAGTTGACTGTATCGTCGA
 GGTCGAATCAAACAAGTTTGTACAAAAAGCTGAACGAGAAACGTAAAATGATATAAATA-

Figure 94C

09914960960

AGGCCGGAACCGGCTTTTCATATAGAATAGAGAAGCGTTCATGACTAAATGCTTGCATCA
CAATACTTGAAGTTGACAATATTATTTAAGGACCTATTGTTTTTTTCCAATAGGTGGTTAG
CAATCGTCTTACTTTCTAACTTTTCTTACCTTTTACATTTTCAGCAATATATATATATATT
TCAAGGATATACCATTTCTAATGTCTGCCCCCTATGTCTGCCCCCTAAGAAGATCGTCGTTTT
GCCAGGTGACCACGTTGGTCAAGAAATCACAGCCGAAGCCATTAAGGTTCTTAAAGCTAT
TTCTGATGTTTCGTTCCAATGTCAAGTTCGATTTTCGAAAATCATTTAATTGGTGGTGCTGC
TATCGATGCTACAGGTGTCCCACTTCCAGATGAGGCGCTGGAAGCCTCCAAGAAGGTTGA
TGCCGTTTTTGTAGGTGCTGTGGGTGGTCCTAAATGGGGTACCGGTAGTGTTAGACCTGA
ACAAGGTTTACTAAAAATCCGTAAAGAACTTCAATTGTACGCCAACTTAAGACCATGTAA
CTTTGCATCCGACTCTCTTTTAGACTTATCTCCAATCAAGCCACAATTTGCTAAAGGTAC
TGACTTCGTTGTTGTGTCAGAGAATTAGTGGGAGGTATTTACTTTGGTAAGAGAAAGGAAGA
CGATGGTGATGGTGTGCTTGGGATAGTGAACAATACACCGTTCCAGAAGTGCAAAGAAT
CACAAGAATGGCCGCTTTTCATGGCCCTACAACATGAGCCACCATTGCCTATTTGGTCCCTT
GGATAAAGCTAATGTTTTTGGCCTCTTCAAGATTATGGAGAAAAAACTGTGGAGGAAACCAT
CAAGAACGAATTCCCTACATTGAAGGTTCAACATCAATTGATTGATTCTGCCGCCATGAT
CCTAGTTAAGAACCCAACCCACCTAAATGGTATTATAATCACCAGCAACATGTTTGGTGA
TATCATCTCCGATGAAGCCTCCGTTATCCCAGGTTCCCTTGGGTTTGTGTCATCTGCGTC
CTTGGCCTCTTTGCCAGACAAGAACACCGCATTTGGTTTGTACGAACCATGCCACGGTTC
TGCTCCAGATTTGCCAAAGAATAAGGTTGACCCTATCGCCACTATCTTGTCTGCTGCAAT
GATGTTGAAATTGTCATTGAACTTGCCCTGAAGAAGGTAAGGCCATTGAAGATGCAGTTAA
AAAGGTTTTTGGATGCAGGTATCAGAACTGGTGATTTAGGTGGTTCCAACAGTACCACCGA
AGTCGGTGATGCTGTGCGCCGAAGAAGTTAAGAAAATCCTTGCTTAAAAAGATTCTCTTTT
TTTATGATATTTGTACATAAACTTTATAAATGAAATTCATAATAGAAACGACACGAAATT
ACAAAATGGAATATGTTCATAGGGTAGACGAACTATATACGCAATCTACATACATTTAT
CAAGAAGGAGAAAAAGGAGGATAGTAAAGGAATACAGGTAAGCAAATTGATACTAATGGC
TCAACGTGATAAGGAAAAAGAATTGCACTTTAACATTAATATTGACAAGGAGGAGGGCAC
CACACAAAAAGTTAGGTGTAACAGAAAATCATGAACTACGATTCCTAATTTGATATTGG
AGGATTTTCTCTAAAAAATAAATAACAATAAAAAACACTCAATGACCTGACCAT
TTGATGGAGTTTAAGTCAATACCTTCTTGAACCATTTCCCATAATGGTGAAAGTTCCCTC
AAGAATTTTACTCTGTGAGAACGGCCTTACGACGTAGTCGATATGGTGCACTCTCAGTA
CAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCGCCAACACCCGCTGACG
CGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGACAAGCTGTGACCGTCTCCG
GGAGCTGCATGTGTCAGAGGTTTTTACCGTCATCACCGAAACGCGCGA

FIGURE 94E

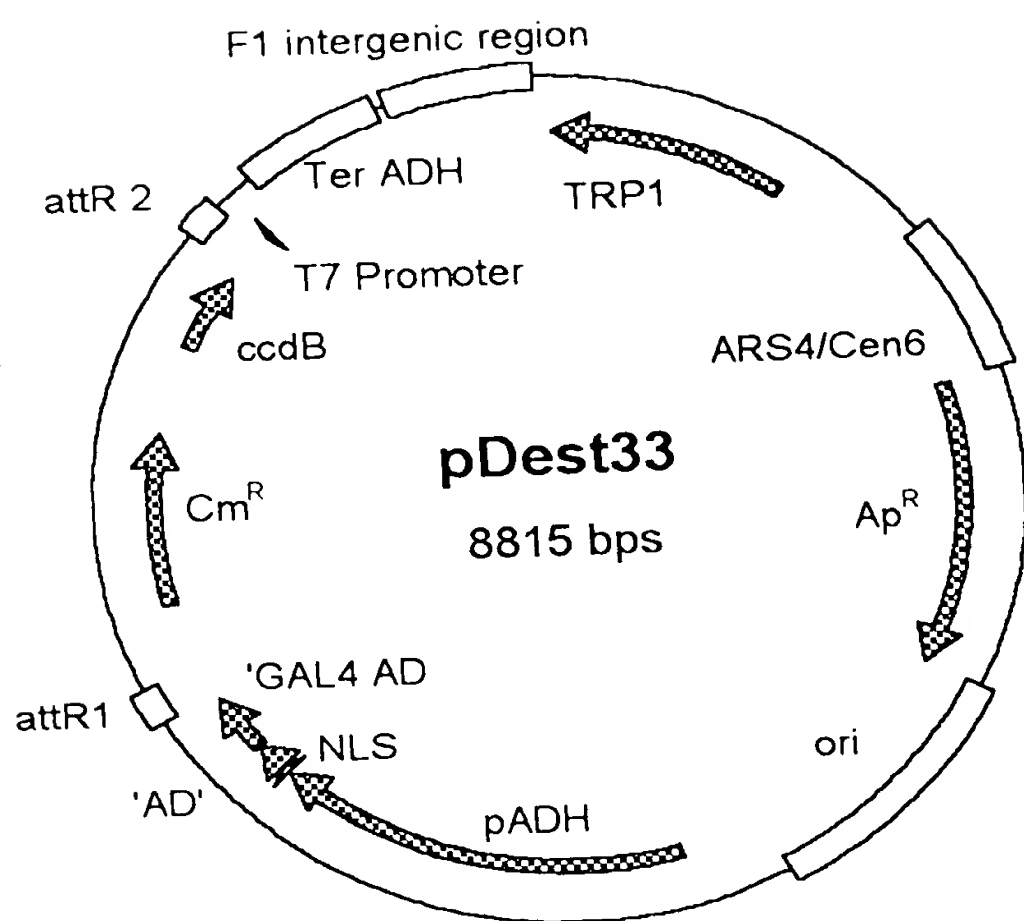


FIGURE 95A

GCCTTACGCATCTGTGCGGTATTTTCACACCGCAGGCAAGTGCACAAACAATACTTAAATA
AATACTACTCAGTAATAACCTATTTCTTAGCATTTTTTGACGAAATTTGCTATTTTGTTAG
AGTCTTTTACACCATTTGTCTCCACACCTCCGCTTACATCAACACCAATAACGCCATTTA
ATCTAAGCGCATCACCAACATTTTCTGGCGTCAGTCCACCAGCTAACATAAAATGTAAGC
TTTCGGGGCTCTCTTGCCTTCCAACCCAGTCAGAAATCGAGTTCCAATCCAAAAGTTCAC
CTGTCCCACCTGCTTCTGAATCAAACAAGGGAATAAACGAATGAGGTTTCTGTGAAGCTG
CACTGAGTAGTATGTTGCAGTCTTTTGGAAATACGAGTCTTTTAATAACTGGCAAACCGA
GGAATCTTGGTATTCTTGCCACGACTCATCTCCATGCAGTTGGACGATATCAATGCCGT
AATCATTGACCAGAGCCAAAACATCCTCCTTAGGTTGATTACGAAACACGCCAACCAAGT
ATTTTCGGAGTGCCTGAACTATTTTTTATATGCTTTTACAAGACTTGAAATTTTCCTTGCAA
TAACCGGGTCAATTGTTCTCTTTCTATTGGGCACACATATAATACCAGCAAGTCAGCAT
CGGAATCTAGAGCACATTCTGCGGCCTCTGTGCTCTGCAAGCCGCAAACCTTTCACCAATG
GACCAGAACTACCTGTGAAATTAATAACAGACATACTCCAAGCTGCCTTTGTGTGCTTAA
TCACGTATACTCACGTGCTCAATAGTCACCAATGCCCTCCCTCTTGGCCCTCTCCTTTTC
TTTTTTTCGACCGAATTAATTCTTAATCGGCAAAAAAAGAAAAGCTCCGGATCAAGATTGT
ACGTAAGGTGACAAGCTATTTTTCAATAAAGAATATCTTCCACTACTGCCATCTGGCGTC
ATAACTGCAAAGTACACATATATTACGATGCTGTCTATTAAATGCTTCCTATATTATATA
TATAGTAATGTCGTTTATGGTGCACCTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAA
GCCAGCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGG
CATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTCAC
CGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTTATAGGTTA
ATGTCATGATAATAATGGTTTCTTAGGACGGATCGCTTGCCTGTAACCTTACACGCGCCTC
GTATCTTTTAAATGATGGAATAATTTGGGAATTTACTCTGTGTTTATTTATTTTATGTTT
TGTATTTGGATTTTAGAAAGTAAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAAA
AAATAAACAAAGGTTTAAAAAATTTCAACAAAAAGCGTACTTTACATATATATTTATTAG
ACAAGAAAAGCAGATTAAATAGATATACATTCGATTAACGATAAGTAAAATGTAAAATCA
CAGGATTTTTCGTGTGTGGTCTTCTACACAGACAAGATGAAACAATTCGGCATTAAATACCT
GAGAGCAGGAAGAGCAAGATAAAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTA
CATCTTCGGAAAACAAAACTATTTTTTCTTTAATTTCTTTTTTTACTTTCTATTTTTTA
TTTATATATTTATATTAAAAAATTTAAATTATAATTATTTTTTATAGCACGTGATGAAAAG
GACCCAGGTGGCACTTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAA
ATACATTCAAATATGTATCCGCTCATGAGACAATAACCTGATAAATGCTTCAATAATAT
TGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGCCCTTATTCCCTTTTTTGCG
GCATTTTGCCTTCCTGTTTTTGTCTACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAA
GATCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTCAACAGCGGTAAGATCCTT
GAGAGTTTTTCGCCCCGAAGAACGTTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGT
GGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTGCGCCGCATACACTAT
TCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATG
ACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTA
CTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTTTCAACATGGGGGAT
CATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAG
CGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACCTATTAACCTGGCGAA
CTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCA
GGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCC
GGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGT
ATCGTAGTTATCTACACGACGGGCAGTCAGGCAACTATGGATGAACGAAATAGACAGATC
GCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACCTGTCAGACCAAGTTTACTCATAT
ATACTTTAGATTGATTTAAAACCTTCATTTTTTAATTTAAAAGGATCTAGGTGAAGATCCTT
TTTGATAATCTCATGACCAAATCCCTTAACGTGAGTTTTTCGTTCCACTGAGCGTCAGAC
CCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGC
TTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTGTTGCCGGATCAAGAGCTACCA
ACTCTTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATAACCAAATACTGTCCTTCTA
GTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCT
CTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTG
GACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGGCTGAACGGGGGGTTCTGTC
ACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCAT-

FIGURE 95B

TGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGG
GTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGGAACGCCTGGTATCTTTATAGT
CCTGTCGGGTTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGG
CCGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGG
CCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACC
GCCTTTGAGTGAGCTGATACCGCTCGCCGCGAGCCGAACGACCGAGCGCAGCGAGTCAGTG
AGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATT
CATTAATGCAGCTGGCACGACAGGTTTCCCGACTGGAAAGCGGGCAGTGAGCGCAACGCA
ATTAATGTGAGTTACCTCACTCATTAGGCACCCCAGGCTTTACACTTTATGCTTCCGGCT
CCTATGTTGTGTGGAATTGTGAGCGGATAACAATTTACACAGGAAACAGCTATGACCAT
GATTACGCCAAGCTCGGAATTAACCTCACTAAAGGGAACAAAAGCTGGGTACCGGGCCC
CCCCTCGAGATCCGGGATCGAAGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATG
AAGGCAAAAGACAAATATAAGGGTCTGAACGAAAAATAAAGTGAAAAGTGTTGATATGATG
TATTTGGCTTTGCGGCGCCGAAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCT
GTGGCGGACCCGCGCTCTTGCCGGCCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGGC
GGAGTTTTTTGCGCCTGCATTTTCCAAGGTTTACCCTGCGCTAAGGGGCGAGATTGGAGA
AGCAATAAGAATGCCGGTTGGGGTTGCGATGATGACGACCACGACAACCTGGTGTCATTAT
TTAAGTTGCCGAAAGAACCTGAGTGCAATTTGCAACATGAGTATACTAGAAGAATGAGCCA
AGACTTGCGAGACGCGAGTTTGCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAG
GTGAGACGCGCATAACCGCTAGAGTACTTTGAAGAGGAAACAGCAATAGGGTTGCTACCA
GTATAAATAGACAGGTACATAACAACACTGGAAATGGTTGTCTGTTTGAGTACGCTTTCAA
TTCATTTGGGTGTGCACTTTATTATGTTACAATATGGAAGGGAACCTTTACACTTCTCCTA
TGCACATATATTAATTAAGTCCAATGCTAGTAGAGAAGGGGGGTAACACCCCTCCGCGC
TCTTTTCCGATTTTTTTTCTAAACCGTGGAATATTTTCGGATATCCTTTTGTTGTTTCCGGG
TGTACAATATGGACTTCCTCTTTTCTGGCAACCAAACCCATACATCGGGATTCTTATAAT
ACCTTCGTTGGTCTCCCTAACATGTAGGTGGCGGAGGGGAGATATACAATAGAACAGATA
CCAGACAAGACATAATGGGCTAAACAAGACTACACCAATTACACTGCCTCATTGATGGTG
GTACATAACGAACATAACTGTAGCCCTAGACTTGATAGCCATCATCATATCGAAGTTTC
ACTACCCCTTTTCCATTTGCCATCTATTGAAGTAATAATAGGCGCATGCAACTTCTTTTC
TTTTTTTTTCTTTTCTCTCTCCCCGTTGTTGTCTCACCATATCCGCAATGACAAAAAA
ATGATGGAAGACACTAAAGGAAAAAATTAACGACAAAGACAGCACCAACAGATGTCGTTG
TTCCAGAGCTGATGAGGGGTATCTTCGAACACACGAAACTTTTTCTTCTTCTTCTTCTC
CACACTACTCTCTAATGAGCAACGGTATACGGCCTTCTTCTCAGTTACTTGAATTTGAAA
TAAAAAAAGTTTGCCGCTTTGCTATCAAGTATAAATAGACCTGCAATTATTAATCTTTTG
TTTCTCGTCATTGTTCTCGTTCCCTTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCTTCT
AGCTATACCAAGCATACAATCAACTCCAAGCTTATGCCCAAGAAGAAGCGGAAGGTCTCG
AGCGGCGCCAATTTTAATCAAAGTGGAATATTGCTGATAGCTCATTGTCCTTCACTTTC
ACTAACAGTAGCAACGGTCCGAACCTCATAACAACCTCAAACAAATTCTCAAGCGCTTTCA
CAACCAATTGCCTCCTCTAACGTTTCATGATAACTTCATGAATAATGAAATCACGGCTAGT
AAAATTGATGATGGTAATAATTCAAACCACTGTACCTGGTTGGACGGACCAAACTGCG
TATAACGCGTTTGGAAATCACTACAGGGATGTTTAATAACCACTACAATGGATGATGTATAT
AACTATCTATTGATGATGAAGATACCCCAACCAACCAAAAAAAGAGGGTGGGTCTGAAT
CAAACAAGTTTGTACAAAAAAGCTGAACGAGAAACGTAAATGATATAAATATCAATATA
TTAAATTAGATTTTGCATAAAAAACAGACTACATAATACTGTAAACACACATATCCAG
TCACTATGGCGGCCGCTAAGTTGGCAGCATCACCCGACGCACTTTGCGCCGAATAAATAC
CTGTGACGGAAGATCACTTCGCAGAATAAATAAATCCTGGTGTCCCTGTTGATACCGGGA
AGCCCTGGGCCAACTTTTGGCGAAAATGAGACGTTGATCGGCACGTAAGAGGTTCCAAC
TTCACCATATGAAATAAGATCACTACCGGGCGTATTTTTTGAGTTATCGAGATTTTCAG
GAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATAACACCGTTGATATATCCC
AATGGCATCGTAAAGAACATTTTGAGGCATTTTCAGTCAGTTGCTCAATGTACCTATAACC
AGACCGTTCAGCTGGATATTACGGCCTTTTTTAAAGACCGTAAAGAAAAATAAGCACAGT
TTTATCCGGCCTTTATTACATTCTTGCCCGCCTGATGAATGCTCATCCGGAATTCCGTA
TGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCCCTTGTTACACCGTTT
TCCATGAGCAAACCTGAAACGTTTTTCATCGCTCTGGAGTGAATACCACGACGATTTCCGGC
AGTTTCTACACATATATTCGCAAGATGTGGCGTGTTACGGTGAAAACCTGGCCTATTTCC
CTAAAGGGTTTATTGAGAATATGTTTTTTCGTCTCAGCCAATCCCTGGGTGAGTTTCACCA
GTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTTCGCCCCCGTTTTTCACCATGGGCA
AATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTACAGGTTTCATCATGCCG-

FIGURE 95C

07-1698

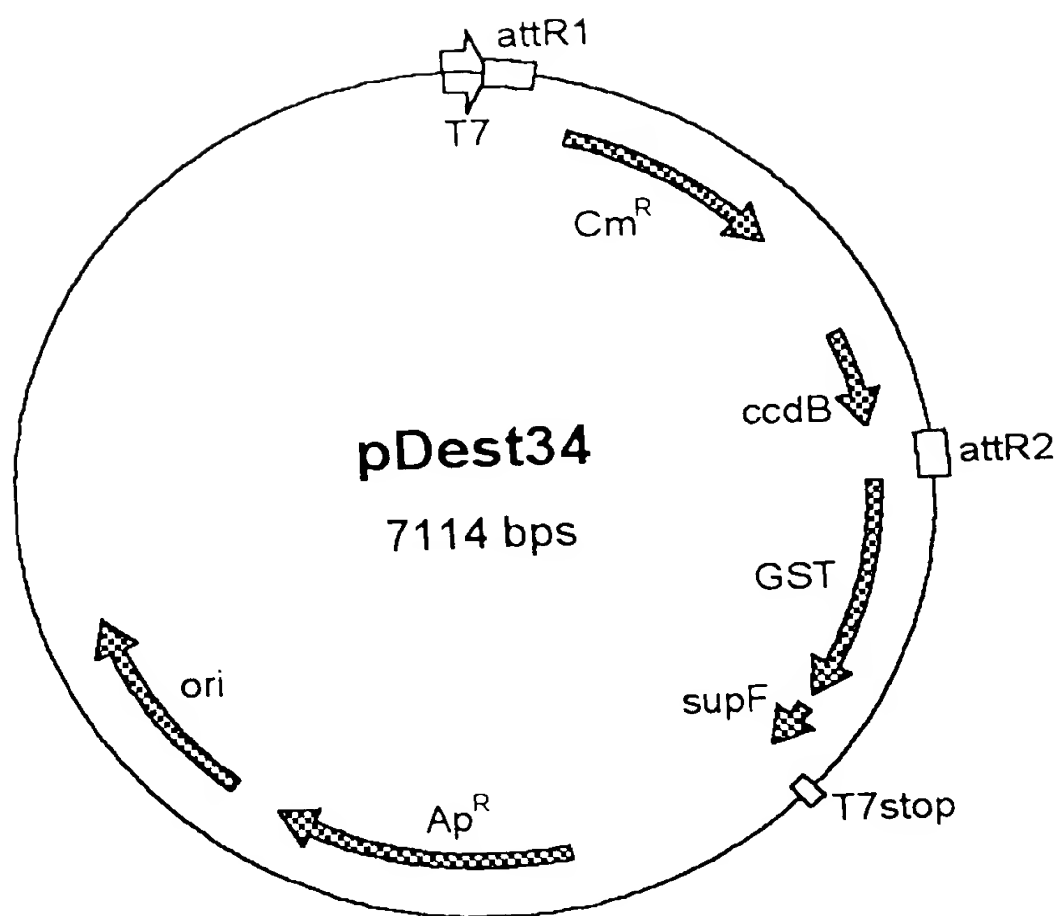


FIGURE 96A

pDEST34

7114 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
195..71	attR1
304..963	CmR
1305..1610	ccdB
1651..1775	attR2
1780..2472	GST
2675..2720	T7stop
3334..4194	ampR
4343..4982	ori

ATCGAGATCTCGATCCCGCGAAATTAATACGACTCACTATAGGGAGACCACAACGGTTTC
 CCTCTAGATCACAAGTTTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAATAT
 CAATATATTAAATTAGATTTTGCATAAAAAACAGACTACATAACTGTAAAACACAACA
 TATCCAGTCACTATGGCGGCCGCGATTAGGCACCCAGGCTTTACACTTTATGCTTCCGGC
 TCGTATAATGTGTGGATTTTGTAGTTAGGATCCGGCGAGATTTTCAGGAGCTAAGGAAGCT
 AAAATGGAGAAAAAATCACTGGATATACCACCGTTGATATATCCCAATGGCATCGTAAA
 GAACATTTTGTAGGCATTTTCAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTCAGCTG
 GATATTACGGCCTTTTAAAGACCGTAAAGAAAAATAAGCACAAAGTTTATCCGGCCTTT
 ATTCACATTCTTGCCCGCCTGATGAATGCTCATCCGGAATTCGGTATGGCAATGAAAGAC
 GGTGAGCTGGTGATATGGGATAGTGTTCACCTTGTTACACCGTTTCCATGAGCAAACCT
 GAAACGTTTTTCATCGCTCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATA
 TATTCGCAAGATGTGGCGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTATT
 GAGAATATGTTTTTCGTCTCAGCCAATCCCTGGGTGAGTTTCACCAAGTTTGTATTAAAC
 GTGGCCAATATGGACAACCTTCTTCGCCCCCGTTTTTCACCATGGGCAAATATTATACGCAA
 GGCGACAAGGTGCTGATGCCGCTGGCGATTTCAGGTTTCATCATGCCGTCTGTGATGGCTTC
 CATGTCCGGCAGAATGCTTAATGAATTACAACAGTACTGCGATGAGTGGCAGGGCGGGGCG
 TAAACGCGTGGATCCGGCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGAT
 TTTTGCGGTATAAGAATATATACTGATATGTATAACCGAAGTATGTCAAAAAGAGGTGTG
 CTATGAAGCAGCGTATTACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCAT
 ATATGATGTCAATATCTCCGGTCTGGTAAGCACAAACCATGCAGAATGAAGCCCGTCGTCT
 GCGTGCCGAACGCTGGAAAGCGGAAAATCAGGAAGGGATGGCTGAGGTGCGCCCGGTTTAT
 TGAAATGAACGGCTCTTTTGCTGACGAGAACAGGGACTGGTGAAATGCAGTTTAAAGGTTT
 ACACCTATAAAAGAGAGAGCCGTTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTG
 ACACGCCCCGGGCGACGGATGGTGATCCCCCTGGCCAGTGCACGTCTGCTGTGATATAAG
 TCTCCCGTGAACCTTTACCCGGTGGTGATATCGGGGATGAAAGCTGGCGCATGATGACCA
 CCGATATGGCCAGTGTGCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACC
 GCGAAAATGACATCAAAAACGCCATTAACCTGATGTTCTGGGGAATATAAATGTCAGGCT
 CCTTATACACAGCCAGTCTGCAGGTGACCATAGTGACTGGATATGTTGTGTTTACAG
 TATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTT
 TACGTTTCTCGTTTCAGCTTTCTTGTACAAAGTGGTGATTATGTCCCCTATACTAGGTTAT
 TGGAATTAAGGGCCTTGTGCAACCCACTCGACTTCTTTTGGAATATCTTGAAGAAAAA
 TATGAAGAGCATTTGTATGAGCGCGATGAAGGTGATAAATGGCGAAACAAAAAGTTTGAA
 TTGGGTTTGGAGTTTCCCAATCTTCCTTATTATATTGATGGTGATGTTAAATTAACACAG
 TCTATGGCCATCATACTTATATAGCTGACAAGCACAAACATGTTGGGTGGTGTCCAAAA
 GAGCGTGCAGAGATTTCAATGCTTGAAGGAGCGGTTTTGGATATTAGATACGGTGTTCG
 AGAATTGCATATAGTAAAGACTTTGAAACTCTCAAAGTTGATTTTCTTAGCAAGCTACCT
 GAAATGCTGAAAATGTTTGAAGATCGTTTATGTCATAAAACATATTTAAATGGTGATCAT
 GTAACCCATCCTGACTTCATGTTGTATGACGCTCTTGATGTTGTTTTATACATGGACCCA
 ATGTGCCTGGATGCGTTCCCAAAATTAGTTTGTTTTAAAAAACGTATTGAAGCTATCCCA
 CAAATTGATAAGTACTTGAATCCAGCAAGTATATAGCATGGCCTTTGCAGGGCTGGCAA
 GCCACGTTTGGTGGTGGCGACCATCCTCCAAATCGGATCTGGTTCGCGTCCATGGGGA
 TCCGGCTGCTAACAAAGCCCGAAAGGAAGCTGAGTTGGCTGCTGCCACCGCTGAGCGCTT
 CCCGATAAGGGAGCAGGCCAGTAAAAGCATTACCCGTGGTGGGGTTCCCGAGCGGCCAAA
 GGGAGCAGACTCTAAATCTGCCGTCATCGACTTCGAAGGTTTGAATCCTTCCCCCACCAC
 CATCACTTTCAAAAGTGAATTCGCTGAGCAATAACTAGCATAACCCCTTGGGGCCTCTAA-

FIGURE 96B

ACGGGTCTTGAGGGGTTTTTTTGCTGAAAGGAGGAACTATATCCGGATATCCACAGGACGG
 GTGTGGTTCGCCATGATCGCGTAGTCGATAGTGGCTCCAAGTAGCGAAGCGAGCAGGACTG
 GCGGGCGGCCAAAGCGGTTCGGACAGTGCTCCGAGAACGGGTGCGCATAGAAATTGCATCA
 ACGCATATAGCGCTAGCAGCACGCCATAGTGACTGGCGATGCTGTTCGGAATGGACGATAT
 CCCGCAAGAGGCCCCGGCAGTACCGGCATAACCAAGCCTATGCCTACAGCATCCAGGGTGA
 CGGTGCCGAGGATGACGATGAGCGCATTGTTAGATTTTCATACACGGTGCCTGACTGCGTT
 AGCAATTTAACTGTGATAAACTACCGCATTAAAGCTTATCGATGATAAGCTGTCAAACAT
 GAGAATTCTTGAAGACGAAAGGGCCTCGTGATACGCCTATTTTTTATAGGTTAATGTCATG
 ATAATAATGGTTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCT
 ATTTGTTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCCTGA
 TAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGC
 CTTATTCCTTTTTTTGCGGCATTTTGCCTTCCTGTTTTTTGCTCACCCAGAAACGCTGGTG
 AAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTC
 AACAGCGGTAAGATCCTTGAGAGTTTTTCGCCCCGAAGAACGTTTTTCCAATGATGAGCACT
 TTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTGTTGACGCCGGGCAAGAGCAACTC
 GGTCGCCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAG
 CATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGAT
 AACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTT
 TTGCACAACATGGGGGATCATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAA
 GCCATAACCAACGACGAGCGTGACACCACGATGCCTGCAGCAATGGCAACAACGTTGCGC
 AAATATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATG
 GAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTTATT
 GCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCA
 GATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGAT
 GAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACCTGTCA
 GACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACCTTCATTTTTTAATTTAAAAGG
 ATCTAGGTGAAGATCCTTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCG
 TTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTT
 CTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTTGTTTG
 CCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATA
 CCAAATACTGTCCTTCTAGTGTAAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCA
 CCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAG
 TCGTGTCTTACCGGGTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGC
 TGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGA
 TACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGG
 TATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAAC
 GCCTGGTATCTTTATAGTCCTGTCGGGTTTTCGCCACCTCTGACTTGAGCGTCGATTTTTG
 TGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTTACGG
 TTCCTGGCCTTTTTGCTGGCCTTTTTGCTCACATGTTCTTTTCTGCGTTATCCCCTGATTCT
 GTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACC
 GAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCTGATGCGGTATTTTCTCCTT
 ACGCATCTGTGCGGTATTTACACCCGCATATATGGTGCACTCTCAGTACAATCTGCTCTG
 ATGCCGCATAGTTAAGCCAGTATACACTCCGCTATCGCTACGTGACTGGGTTCATGGCTGC
 GCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATC
 CGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTTACCCGTC
 ATCACCGAAACGCGCGAGGCAGCTGCGGTAAAGCTCATCAGCGTGGTTCGTGAAGCGATTCT
 ACAGATGTCTGCCTGTTTCATCCGCGTCCAGCTCGTTGAGTTTTCTCCAGAAGCGTTAATGT
 CTGGCTTCTGATAAAGCGGGCCATGTTAAGGGCGGTTTTTTTCTGTTTGGTCACTGATGC
 CTCCGTGTAAGGGGGATTCTGTTTCATGGGGGTAATGATACCGATGAAACGAGAGAGGAT
 GCTCACGATACGGGTTACTGATGATGAACATGCCCGGTTACTGGAACGTTGTGAGGGTAA
 ACAACTGGCGGTATGGATGCGGCGGGACCAGAGAAAAATCACTCAGGGTCAATGCCAGCG
 CTTTCGTTAATACAGATGTAGGTGTTCCACAGGGTAGCCAGCAGCATCCTGCGATGCAGAT
 CCGGAACATAATGGTGCAGGGCGCTGACTTCCGCGTTTTCCAGACTTTACGAAACACGGAA
 ACCGAAGACCATTCATGTTGTTGCTCAGGTGCGCAGACGTTTTTGCAGCAGCAGTCGCTTCA
 CGTTTCGCTCGCGTATCGGTGATTCAATTCTGCTAACCAGTAAGGCAACCCCGCCAGCCTAG
 CCGGGTCTTCAACGACAGGAGCACGATCATGCGCACCCGTTGGCCAGGACCCAACGCTGCC
 CGAGATGCGCCGCGTGCGGCTGCTGGAGATGGCGGACGCGATGGATATGTTCTGCCAAGG
 GTTGGTTTTGCGCATTACAGTTCTCCGCAAGAATTGATTGGCTCCAATTCTTGGAGTGGT-

FIGURE 96C

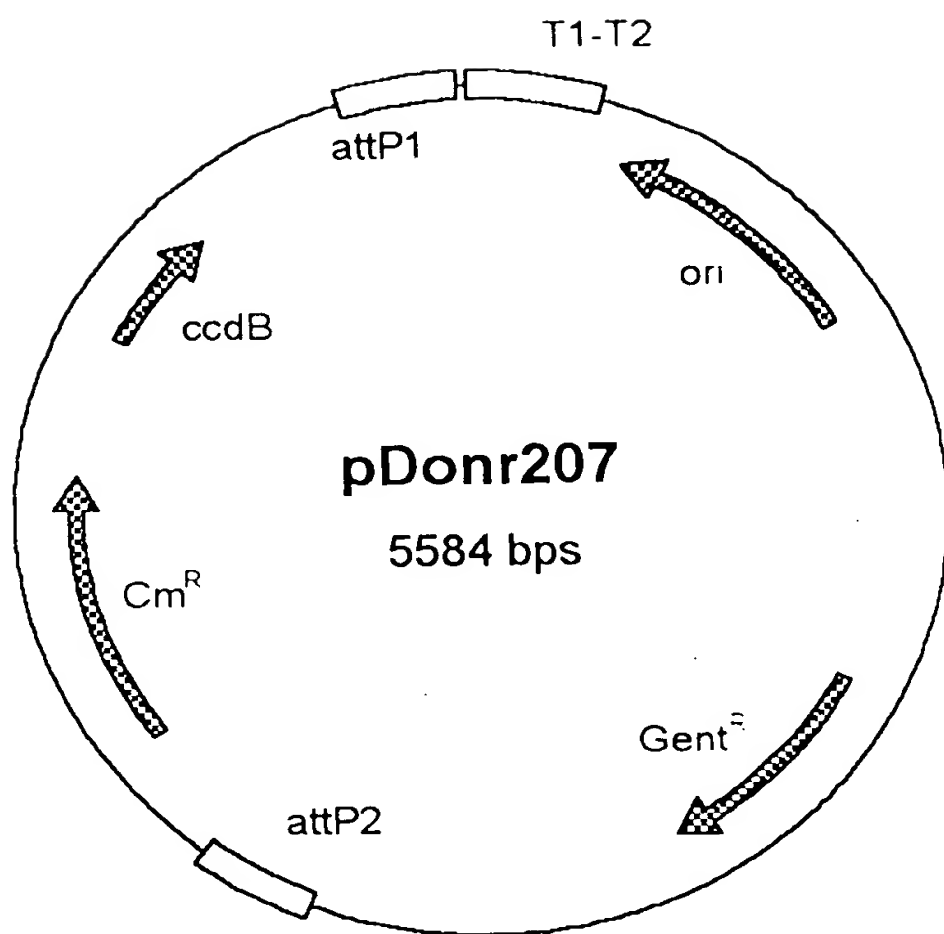


FIGURE 97A

GCGAGAGTAGGGAACTGCCAGGCATCAAATAAAACGAAAGGCTCAGTCGGAAGACTGGGC
CTTTCGTTTTATCTGTTGTTTGTCTGGTGAACGCTCTCCTGAGTAGGACAAATCCGCCGGG
AGCGGATTTGAACGTTGTGAAGCAACGGCCCGGAGGGTGGCGGGCAGGACGCCCCGCCATA
AACTGCCAGGCATCAAATAAGCAGAAGGCCATCCTGACGGATGGCCTTTTTTGCCTTTCT
ACAAACTCTTCTGGCTAGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGA
AAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTG
GCGTTTTTCCATAGGCTCCGCCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAG
AGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTC
GTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCG
GGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTGCTT
CGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTTACGCCGACCGCTGCGCCTTATCC
GGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCC
ACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGG
TGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCA
GTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGC
GGTGGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGAT
CCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGAACGAAACTCACGTTAAGGGATT
TTGGTCATGAGCTTGCGCCGTCCCGTCAAGTCAGCGTAATGCTCTGCCAGTGTTACAACC
AATTAACCAATTCTGATTAGAAAACTCATCGAGCATCAAATGAACTGCAATTTATTCA
TATCAGGATTATCAATAACCATATTTTTGAAAAAGCCGTTTCTGTAATGAAGGAGAAAACT
CACCGAGGCAGTTCCATAGGATGGCAAGATCCTGGTATCGGTCTGCGATTCCGACTCGTC
CAACATCAATACAACCTATTAGTAGCCAACCACTAGAACTATAGCTAGAGTCCTGGGCGA
ACAAACGATGCTCGCCTTCCAGAAAACCGAGGATGCGAACCCTTATCCGGGGTTCAGCA
CCACCGGCAAGCGCCGCGACGGCCGAGGTCTTCCGATCTCCTGAAGCCAGGGCAGATCCG
TGCACAGCACCTTGCCGTAGAAGAACAGCAAGGCCGCCAATGCCTGACGATGCGTGGAGA
CCGAAACCTTGCGCTCGTTCCGCCAGCCAGGACAGAAATGCCTCGACTTCGCTGCTGCCCA
AGGTTGCCGGGTGACGCACACCGTGGAACGGATGAAGGCACGAACCCAGTTGACATAAG
CCTGTTCCGGTTCGTAAACTGTAATGCAAGTAGCGTATGCGCTCACGCAACTGGTCCAGAA
CCTTGACCGAACGCAGCGGTGGTAACGGCGCAGTGGCGGTTTTTCATGGCTTGTTATGACT
GTTTTTTTTGTACAGTCTATGCCTCGGGCATCCAAGCAGCAAGCGCGTTACGCCGTGGGTC
GATGTTTGATGTTATGGAGCAGCAACGATGTTACGCAGCAGCAACGATGTTACGCAGCAG
GGCAGTCGCCCTAAAACAAAGTTAGGTGGCTCAAGTATGGGCATCATTTCGCACATGTAGG
CTCGGCCCTGACCAAGTCAAATCCATGCGGGCTGCTCTTGATCTTTTTCGGTTCGTGAGTTC
GGAGACGTAGCCACCTACTCCCAACATCAGCCGGACTCCGATTACCTCGGGAACCTTGCTC
CGTAGTAAGACATTCATCGCGCTTGCTGCCTTCGACCAAGAAGCGGTTGTTGGCGCTCTC
GCGGCTTACGTTCTGCCCAGGTTTGAGCAGCCGCGTAGTGAGATCTATATCTATGATCTC
GCAGTCTCCGGCGAGCACCGGAGGCAGGGCATTGCCACCGCGCTCATCAATCTCCTCAAG
CATGAGGCCAACGCGCTTGGTGCTTATGTGATCTACGTGCAAGCAGATTACGGTGACGAT
CCCGCAGTGGCTCTCTATACAAAGTTGGGCATACGGGAAGAAGTGATGCACTTTGATATC
GACCAAGTACCGCCACCTAACAATTCGTTCAAGCCGAGATCGGCTTCCCGGCCTAATTT
CCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGACGACTGAATCCGG
TGAGAATGGCAAAAGTTTATGCATTTCTTTCCAGACTTGTTCAACAGGCCAGCCATTACG
CTCGTCATCAAATCACTCGCATCAACCAACCGTTATTCAATTCGTGATTGCGCCTGAGC
GAGACGAAATACGCGATCGCTGTTAAAAGGACAATTACAAACAGGAATCGAATGCAACCG
GCGCAGGAACACTGCCAGCGCATCAACAATATTTTACCTGAATCAGGATATTCTTCTAA
TACCTGGAATGCTGTTTTTCCGGGGATCGCAGTGGTGAGTAACCATGCATCATCAGGAGT
ACGGATAAAATGCTTGATGGTCCGAAGAGGCATAAATTCGTCAGCCAGTTTAGTCTGAC
CATCTCATCTGTAACATCATTGGCAACGCTACCTTTGCCATGTTTTCAGAAACAACTCTGG
CGCATCGGGCTTCCCATAACAAGCGATAGATTGTGCGACCTGATTGCCCCGACATTATCGCG
AGCCCATTTATACCCATATAAATCAGCATCCATGTTGGAATTTAATCGCGGCCTCGACGT
TTCCCGTTGAATATGGCTCATAACACCCCTGTATTACTGTTTATGTAAGCAGACAGTTT
TATTGTTTCATGATGATATATTTTTTATCTTGTGCAATGTAACATCAGAGATTTTGAGACAC
GGGCCAGAGCTGCAGCTGGATGGCAAATAATGATTTTTTACTGATAGTGACCTGTT
CGTTGCAACAAATTGATAAGCAATGCTTTCTTATAATGCCAACTTTGTACAAGAAAGCTG
AACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGAATCAACTACTTAGATG-

FIGURE 97B

pMAB85

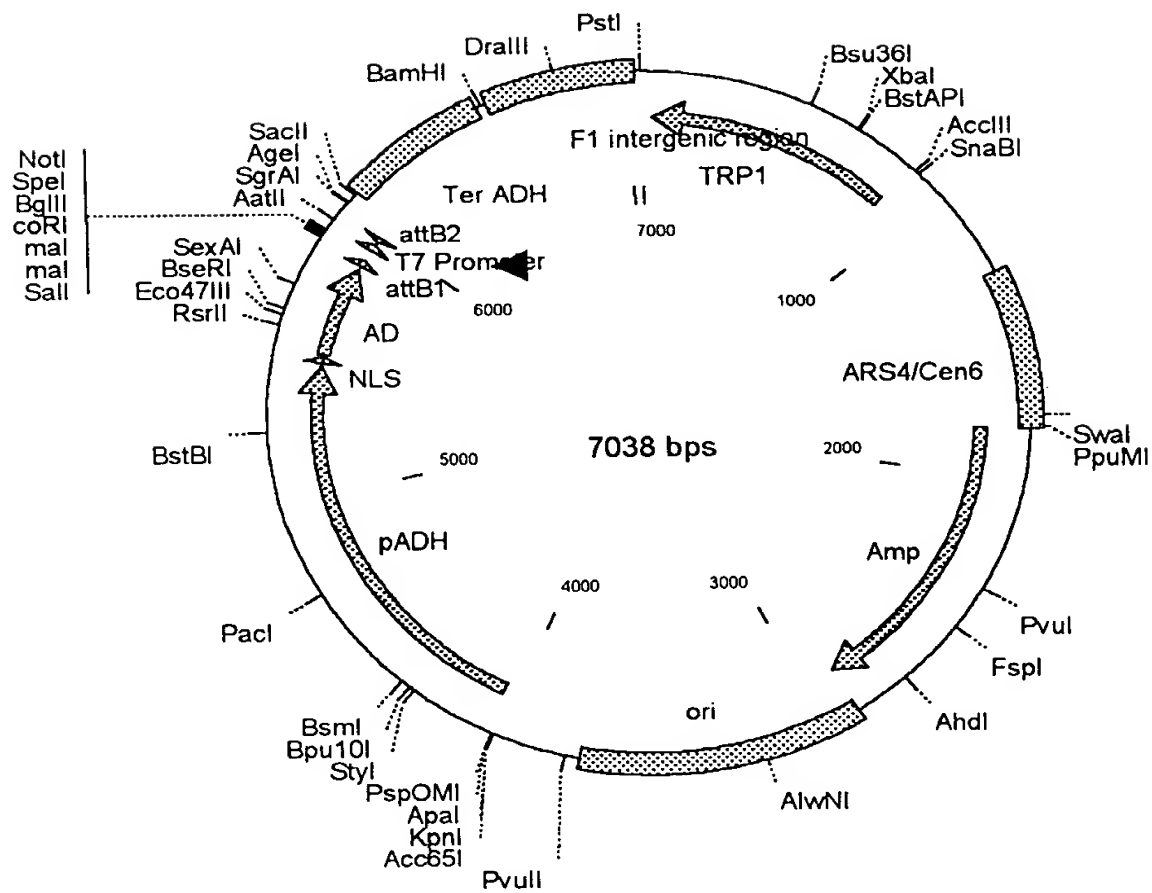


FIGURE 98A

GCCTTACGCATCTGTGCGGTATTTTCACACCGCAGGCAAGTGCACAAACAATACTTAAATA
AATACTACTCAGTAATAACCTATTTCTTAGCATTTTTTGACGAAATTTGCTATTTTGTTAG
AGTCTTTTACACCATTTTGTCTCCACACCTCCGCTTACATCAACACCAATAACGCCATTTA
ATCTAAGCGCATCACCAACATTTTCTGGCGTCAGTCCACCAGCTAACATAAAATGTAAGC
TTTCGGGGCTCTCTTGCCTTCCAACCCAGTCAGAAATCGAGTTCCAATCCAAAAGTTCAC
CTGTCCCACCTGCTTCTGAATCAAACAAGGGAATAAACGAATGAGGTTTCTGTGAAGCTG
CACTGAGTAGTATGTTGCAGTCTTTTGGAAATACGAGTCTTTTAATAACTGGCAAACCGA
GGAACCTTTGGTATTCTTGCCACGACTCATCTCCATGCAGTTGGACGATATCAATGCCGT
AATCATTGACCAGAGCCAAAACATCCTCCTTAGGTTGATTACGAAACACGCCAACCAAGT
ATTTTCGGAGTGCCTGAACATTTTTTATATGCTTTTACAAGACTTGAAATTTTCCTTGCAA
TAACCGGGTCAATTGTTCTCTTTCTATTGGGCACACATATAATACCCAGCAAGTCAGCAT
CGGAATCTAGAGCACATTCTGCGGCCTCTGTGCTCTGCAAGCCGCAAACCTTTCACCAATG
GACCAGAACTACCTGTGAAATTAATAACAGACATACTCCAAGCTGCCTTTGTGTGCTTAA
TCACGTATACTCACGTGCTCAATAGTCACCAATGCCCTCCCTCTTGGCCCTCTCCTTTTC
TTTTTTTCGACCGAATTAATTCTTAATCGGCAAAAAAAGAAAAGCTCCGGATCAAGATTGT
ACGTAAGGTGACAAGCTATTTTTCAATAAAGAATATCTTCCACTACTGCCATCTGGCGTC
ATAACTGCAAAGTACACATATATTACGATGCTGTCTATTAAATGCTTCCTATATTATATA
TATAGTAATGTCGTTTATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAA
GCCAGCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGG
CATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGTCAGAGGTTTTCAC
CGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTTATAGGTTA
ATGTCATGATAATAATGGTTTCTTAGGACGGATCGCTTGCCTGTAACCTTACACGCGCCTC
GTATCTTTTAATGATGGAATAATTTGGGAATTTACTCTGTGTTTATTTATTTTATGTTT
TGTATTTGGATTTTAGAAAGTAAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAAA
AAATAAACAAAGGTTTAAAAAATTTCAACAAAAAGCGTACTTTACATATATATTTATTAG
ACAAGAAAAGCAGATTAAATAGATATACATTTCGATTAAACGATAAGTAAAATGTAAAATCA
CAGGATTTTCGTGTGTGGTCTTCTACACAGACAAGATGAAACAATTCGGCATTAATACCT
GAGAGCAGGAAGAGCAAGATAAAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTA
CATCTTCGGAAAACAAAAACTATTTTTTCTTTAATTTCTTTTTTTTACTTTCTATTTTTTA
TTTATATATTTATATTAAAAAATTTAAATTATAATTATTTTTTATAGCACGTGATAAAG
GACCCAGGTGGCACTTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAA
ATACATTTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATAT
TGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGCCCTTATTCCTTTTTTTGCG
GCATTTTGCCTTCTGTGTTTTTGCTCACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAA
GATCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTCAACAGCGGTAAGATCCTT
GAGAGTTTTTCGCCCCGAAGAACGTTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGT
GGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTGCGCGCATACACTAT
TCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATG
ACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTA
CTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTTTCAACATGGGGGAT
CATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAG
CGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACCTATTAACCTGGCGAA
CTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCA
GGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCC
GGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGT
ATCGTAGTTATCTACACGACGGGCAGTCAGGCAACTATGGATGAACGAAATAGACAGATC
GCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACCTGTCAGACCAAGTTTACTCATAT
ATACTTTAGATTGATTTAAAACTTCATTTTTTAATTTAAAAGGATCTAGGTGAAGATCCTT
TTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTTCGTTCCACTGAGCGTCAGAC
CCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTTCTGCGCGTAATCTGCTGC
TTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTGTTGCCGGATCAAGAGCTACCA
ACTCTTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCAAATACTGTCTTCTA
GTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCT
CTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTG
GACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCCGGGCTGAACGGGGGGTTTCGTGC-

FIGURE 98B

ACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCAT
TGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGG
GTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGGAACGCCTGGTATCTTTATAGT
CCTGTCGGGTTTTCGCCACCTCTGACTTGAGCGTCGATTTTTTGTGATGCTCGTCAGGGGGG
CCGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTTACGGTTCCTGGCCTTTTGCTGG
CCTTTTGCTCACATGTTCTTTCTGCGTTATCCCTGATTCTGTGGATAACCGTATTACC
GCCTTTGAGTGAGCTGATACCGCTCGCCGACGCCGAACGACCGAGCGCAGCGAGTCAGTG
AGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATT
CATTAATGCAGCTGGCACGACAGGTTTCCCGACTGGAAAGCGGGCAGTGAGCGCAACGCA
ATTAATGTGAGTTACCTCACTCATTAGGCACCCCAGGCTTTACACTTTTATGCTTCCGGCT
CCTATGTTGTGTGGAATTGTGAGCGGATAACAATTTACACACAGGAAACAGCTATGACCAT
GATTACGCCAAGCTCGGAATTAACCTCACTAAAGGGAAACAAAAGCTGGGTACCGGGCCC
CCCCTCGAGATCCGGGATCGAAGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATG
AAGGCAAAAGACAAATATAAGGGTTCGAACGAAAAATAAAGTGAAAAGTGTTGATATGATG
TATTTGGCTTTGCGGCGCCGAAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCT
GTGGCGGACCCGCGCTCTTGCCGGCCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGGC
GGAGTTTTTTTGCCTGCAATTTTCCAAGGTTTACCCTGCGCTAAGGGGCGAGATTGGAGA
AGCAATAAGAATGCCGGTTGGGGTTGCGATGATGACGACCACGACAACCTGGTGTCAATTAT
TTAAGTTGCCGAAAGAACCTGAGTGCATTTGCAACATGAGTATACTAGAAGAATGAGCCA
AGACTTGCGAGACGCGAGTTTGCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAG
GTGAGACGCGCATAACCGCTAGAGTACTTTGAAGAGGAAACAGCAATAGGGTTGCTACCA
GTATAAATAGACAGGTACATAACAACACTGGAAATGGTGTGTCTGTTTGTGAGTACGCTTTCAA
TTCATTTGGGTGTGCACTTTATTATGTTACAATATGGAAGGGAACTTTACACTTCTCCTA
TGCACATATATTAATTAAAGTCCAATGCTAGTAGAGAAGGGGGGTAACACCCCTCCGCGC
TCTTTTCCGATTTTTTTTCTAAACCGTGGAATATTTTCGGATATCCTTTTGTGTTTCCGGG
TGTACAATATGGACTTCCTCTTTTCTGGCAACCAAACCCATACATCGGGATTCTCTATAAT
ACCTTCGTTGGTCTCCCTAACATGTAGGTGGCGGAGGGGAGATATACAATAGAACAGATA
CCAGACAAGACATAATGGGCTAAACAAGACTACACCAATTACACTGCCTCATTGATGGTG
GTACATAACGAACTAATACTGTAGCCCTAGACTTGATAGCCATCATCATATCGAAGTTTC
ACTACCCTTTTTTCCATTTGCCATCTATTGAAGTAATAATAGGCGCATGCAACTTCTTTTC
TTTTTTTTTCTTTTCTCTCCCCCGTTGTTGTCTCACCATATCCGCAATGACAAAAAAA
ATGATGGAAGACACTAAAGGAAAAAATTAACGACAAAGACAGCACCAACAGATGTCGTTG
TTCCAGAGCTGATGAGGGGTATCTTCGAACACACGAAACTTTTTCTTCTCCTTCATTACAG
CACACTACTCTCTAATGAGCAACGGTATACGGCCTTCCTTCCAGTTACTTGAATTTGAAA
TAAAAAAAGTTTGCCGCTTTGCTATCAAGTATAAATAGACCTGCAATTATTAATCTTTTG
TTTCTCGTCATTGTTCTCGTTCCCTTTCTTCTTCTTTTCTGCACAATATTTCA
AGCTATACCAAGCATAACAATCAACTCCAAGCTTATGCCCAAGAAGAAGCGGAAGGTCTCG
AGCGGCGCCAATTTTAATCAAAGTGGAATATTGCTGATAGCTCATTGTCCTTCACTTTC
ACTAACAGTAGCAACGGTCCGAACCTCATAACAACCTCAAACAAATTCTCAAGCGCTTTCA
CAACCAATTGCCTCCTCTAACGTTTCATGATAACTTCATGAATAATGAAATCACGGCTAGT
AAAATTGATGATGGTAATAATTCAAACCACTGTACCTGGTTGGACGGACCAAACTGCG
TATAACGCGTTTGGAAATCACTACAGGGATGTTTAATAACCACTACAATGGATGATGTATAT
AACTATCTATTGATGATGAAGATACCCACCAAACCCAAAAAAGAGGGTGGGTGCGATC
ACAAGTTTGTACAAAAAAGCAGGCTTGTGACCCCGGGAATTCAGATCTACTAGTGCGGC
CGCACGCGTACCCAGCTTTCTTGTACAAAGTGGTGACGTGAGCTCCCTATAGTGAGTCG
TATTACACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACACCGGTGAGCTCTAAGT
AAGTAACGGCCGCCACCGCGGTGGAGCTTTGGACTTCTTCGCCAGAGGTTTGGTCAAGTC
TCCAATCAAGGTTGTGCGCTTGTCTACCTTGCCAGAAATTTACGAAAAGATGGAAAAGGG
TCAAATCGTTGGTAGATACGTTGTTGACACTTCTAAATAAGCGAATTTCTTATGATTTAT
GATTTTTTATTATTAAATAAGTTATAAAAAAATAAGTGATACAAATTTTAAAGTGACTC
TTAGGTTTTTAAACGAAAATTCTTGTTCTTGAGTAACTCTTTCTGTAGGTCAGGTTGCT
TTCTCAGGTATAGCATGAGGTCGCTCTTATTGACCACACCTCTACCGGCATGCCGAGCAA
ATGCCTGCAATCGCTCCCCATTTACCCCAATTGTAGATATGCTAACTCCAGCAATGAGT
TGATGAATCTCGGTGTGTATTTTTATGTCCTCAGAGGACAATACCTGTTGTAATCGTTCTT
CCACACGGATCCGCATCAGGCGAAATTGTAAACGTTAATATTTTGTAAATTCGCGTTA
AATATTTGTAAATCAGCTCATTTTTTAAACCAATAGGCCGAAATCGGCAAAATCCCTTAT
AAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAAACAAGAGTCCA
CTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAACCGTCTATCAGGGCGATGGC-

FIGURE 98C

CCACTACGTGAACCATCACCCCTAATCAAGTTTTTTGGGGTCGAGGTGCCGTAAAGCACTA
AATCGGAACCCCTAAAGGGAGCCCCCGATTAGAGCTTGACGGGGAAAGCCGGCGAACGTG
GCGAGAAAGGAAGGGAAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG
GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCC
CATTCGCCATTCACTGCA

FIGURE 98D

pMAB86

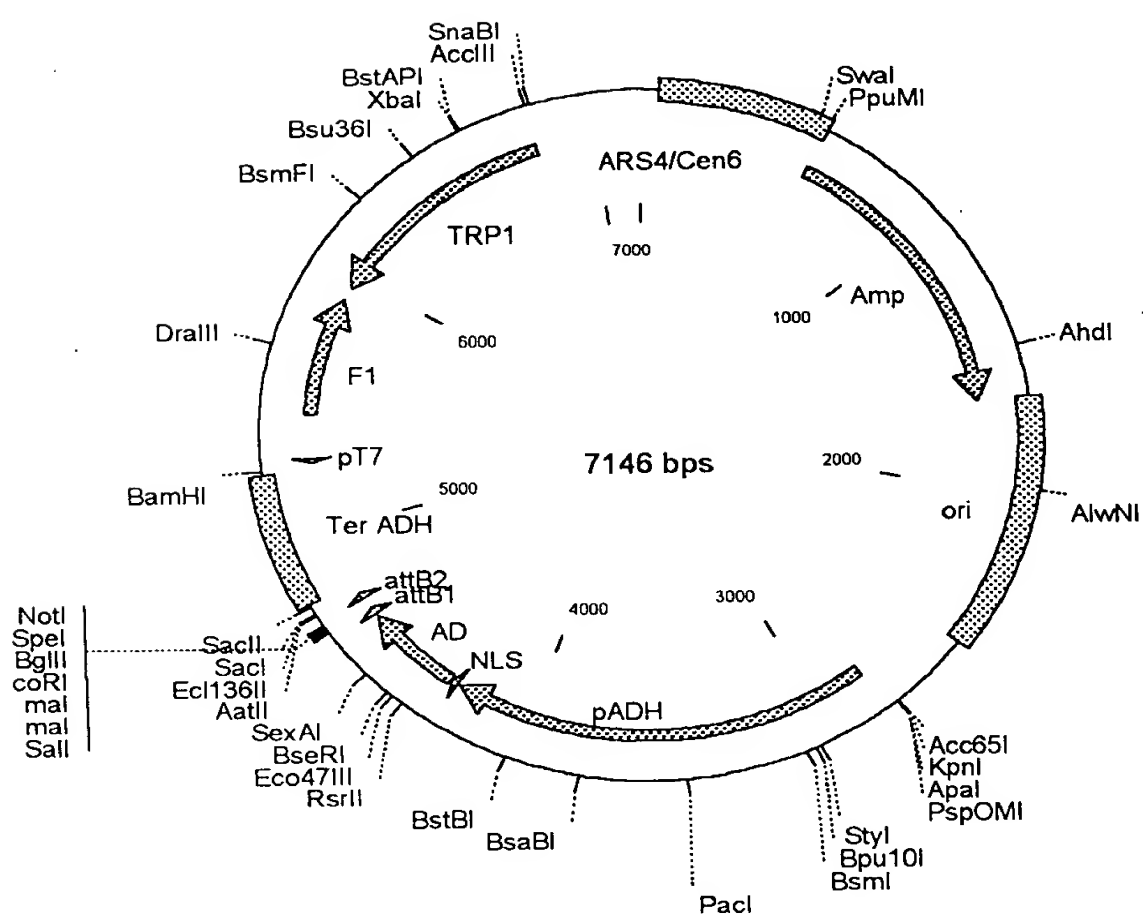


FIGURE 99A

GACGAAAGGGCCTCGTGATACGCCTATTTTTTATAGGTTAATGTCATGATAATAATGGTTT
CTTAGGACGGATCGCTTGCCTGTAACCTACACGCGCCTCGTATCTTTTAATGATGGAATA
ATTTGGGAATTTACTCTGTGTTTATTTATTTTTATGTTTTGTATTTGGATTTTAGAAAGT
AAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAAAAAATAACAAAGGTTTAAAAA
ATTTCAACAAAAAGCGTACTTTACATATATATTTATTAGACAAGAAAAGCAGATTAAATA
GATATACATTTCGATTAACGATAAGTAAAATGTAAAATCACAGGATTTTCGTGTGTGGTCT
TCTACACAGACAAGATGAAACAATTCGGCATTAATACCTGAGAGCAGGAAGAGCAAGATA
AAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTACATCTTCGGAAAAACAAAACT
ATTTTTTCTTTAATTTCTTTTTTTTACTTTCTATTTTTTAATTTATATATTTATATTA
ATTTAAATTATAATTATTTTTTATAGCACGTGATGAAAAGGACCCAGGTGGCACTTTTCGG
GGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCG
CTCATGAGACAATAACCCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGT
ATTCACATTTCCGTGTCGCCCTTATTCCTTTTTTTCGCGGCATTTTGCCTTCCTGTTTTT
GCTCACCAGAAACGCTGGTGAAAGTAAAGATGCTGAAGATCAGTTGGGTGCACGAGTG
GGTTACATCGAAGTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTTCGCCCCGAAGAA
CGTTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATT
GACGCCGGGCAAGAGCAACTCGGTCCGCGCATACACTATTCTCAGAATGACTTGGTTGAG
TACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGT
GCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGA
CCGAAGGAGCTAACCGCTTTTTTTTCAACAATGGGGGATCATGTAACCTCGCCTTGATCGT
TGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTA
GCAATGGCAACAACGTTGCGCAAACCTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGG
CAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCC
CTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGT
ATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACG
GGCAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTG
ATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAA
CTTCATTTTTTAATTTAAAAGGATCTAGGTGAAGATCCTTTTTTGATAATCTCATGACCAA
ATCCCTTAACGTGAGTTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGA
TCTTCTTGAGATCCTTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCG
CTACCAGCGGTGGTTTGTGTTGCCGGATCAAGAGCTACCAACTCTTTTTTCCGAAGGTAACT
GGCTTCAGCAGAGCGCAGATAACCAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCAC
CACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTG
GCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCG
GATAAGGCGCAGCGGTCCGGCTGAACGGGGGGTTCTGTGCACACAGCCCAGCTTGGAGCGA
ACGACCTACACCGAACTGAGATACCTACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCC
GAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCCGAACAGGAGAGCGCACG
AGGGAGCTTCCAGGGGGGAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTC
TGAATTGAGCGTCGATTTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCC
AGCAACGCGGCCTTTTTTACGGTTCCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTT
CCTGCGTTATCCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACC
GCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGC
CCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCTGGCACGAC
AGGTTTCCCGACTGGAAAGCGGGCAGTGAGCGCAACGCAATTAATGTGAGTTACCTCACT
CATTAGGCACCCAGGCTTTACACTTTATGCTTCCGGCTCCTATGTTGTGTGGAATTGTG
AGCGGATAACAATTTACACAGGAAACAGCTATGACCATGATTACGCCAAGCTCGGAATT
AACCCTCACTAAAGGGAACAAAAGCTGGGTACCGGGCCCCCCCCCTCGAGATCCGGGATCGA
AGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATGAAGGCAAAAGACAAATATAAG
GGTCGAACGAAAAATAAAGTGAAAAGTGTTGATATGATGTATTTGGCTTTGCGGCGCCGA
AAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCTGTGGCGGACCCGCGCTCTTGC
CGGCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGGCGGAGTTTTTTTGCGCCTGCATT
TTCCAAGGTTTACCCTGCGCTAAGGGGCGAGATTGGAGAAGCAATAAGAATGCCGGTTGG
GGTTGCGATGATGACGACCACGACAACCTGGTGTCATTATTTAAGTTGCCGAAAGAACCTG
AGTGCATTTGCAACATGAGTATACTAGAAGAATGAGCCAAGACTTGCGAGACGCGAGTTT
GCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAGGTGAGACGCGCATAACCGCTA-

FIGURE 99B

